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ETIOLOGY OF BREECH PRESENTATION AND PRENATAL CARE

Harold S. Morgan, M.D., Lincoln, Neb.

• *The causes of breech presentation have been the subject of dispute, but those that are known are not amenable to control. High fetal mortalities have been associated with it in the past. When it is recognized, adequate prenatal care is especially important. Consultation is required, and the consultant should assist in the delivery. External version is avoided. Manual aid sufficed in 95% out of 500 breech deliveries. The approach has been conservative in all, and only rarely is version and extraction attempted.*

Many etiological factors have been advanced to explain the presentation of the fetus by the breech. Historically, prematurity, multiparity, placenta previa, hydrocephalus, multiple pregnancy, contracted pelvis, and pelvic tumor have been cited as the principal causes of this presentation. As one browses through the literature, however, one cannot fail to detect a faint bewilderment on the part of the several contributors as to the precise factor or factors responsible for this error in polarity.

In 1938, Schumann[1] stated, "I am firmly convinced that in the greater number of cases, the cause of breech presentation is purely accidental." Vartan,[2] in 1940, said that what impressed him concerning the etiology of breech presentation was that most of the factors reported to be causes seldom occurred. In 1945, Vartan,[3] again writing on the etiology of this presentation, stated that he believed that the reason breeches persisted until term was not to be sought in the factors that prevented the head from engaging but in those factors that prevented spontaneous version from taking place. He believed that extension of the legs, giving the fetus an extended attitude, was a prime factor. Weisman[4] stated that prematurity plays a definite causal role. By periodic x-ray studies he demonstrated that 24% of fetuses presented by the breech at the 13th to 20th week and that this decreased to 8% by the 28th to the 30th week. By the 38th to 40th week, about 40% of the fetuses underwent spontaneous version.

Tompkins,[5] in 1946, wrote that only about 4% of term breech presentations could be accounted for, and these were on the basis of fetal anomalies, pelvic tumor, and uterine anomalies. In 1949, Stevenson[6] first advanced his theory of the relation of placental implantation to the presentation of the fetus, and, in 1950,[7] he elaborated on this theme as it related to breech presentation. As a result of his studies, he proposed a new obstetric principle: "The position of the implanted placenta in the term or near term human uterus, as it indents and alters the ovoid shape of the amniotic sac, determines the polarity of the sac independently of the fixed polarity of the containing uterus; functionally the fetus accommodates itself to the shape of the sac, the fetal head seeking its smaller pole; and thus the placental implantation site has a determining effect upon the presentation of the fetus."

Stevenson's work is well worth review by those who are interested in this particular aspect of breech presentation. Since the original report, he has accumulated a larger series of cases bearing out his original thesis. We at the Lincoln General Hospital have been able to palpate the site of the placenta in cases in which cesarean section was done for the primary indication of breech presentation and have found the placenta to be in the cornual area, as mentioned by Stevenson. Titus's textbook[8] shows a frozen section through the uterus of a woman who died at term. The fetus is in the breech position and the placenta occupies the lateral cornual position.

Prenatal Management

The management of breech presentation becomes highly important when we consider that its incidence is variously reported as being between 3 and 4% and that the fetal mortality in breech delivery ranges from 1 to 12%. Drs. Ross (this issue, page 331) and Hughes (page 332) will cover the procedures and techniques commonly used and of proved value in the conduct of labor, while I shall confine my remarks to the management of the patient prior to the onset of labor. It is understood, I believe, by all of us that

From the Department of Obstetrics and Gynecology, Lincoln General Hospital.
Read in the Panel on Breech Presentation before the Section on Obstetrics and Gynecology at the 105th Annual Meeting of the American Medical Association, Chicago, June 12, 1956.

prenatal care in all cases must be adequate to safeguard the patient from the many complicating factors likely to develop during the pregnancy. Adequate dietary supervision, through a fixed office or clinic appointment schedule, blood pressure readings, urinalyses, and blood studies are all taken for granted in modern management of the obstetric patient, whether she is cared for in rural or in urban areas, by a generalist or a specialist. Where then does the prenatal management of the patient with her baby presenting by the breech differ from that of any other gravida? What information must we have and what procedures can we utilize that will aid us in reducing the inherent risk to the fetus in breech presentation?

In order to answer these questions I must draw upon the experience gained through a previously reported study[9] of 500 consecutive breech deliveries in which we were able to show a corrected fetal mortality rate of 1%. When this study was compiled, the commonly accepted standards for correction were used; namely, prematurity with weight of 1,550 gm. (3 lb. 7 oz.) to 2,499 gm. (5 lb. 8 oz.), death of the fetus before admission of the patient to the hospital, fetal abnormalities incompatible with life, and death of the fetus due to an associated placenta previa or premature separation of the placenta.

We have attributed our good results primarily to four factors: 1. Our prenatal care has been of such a nature as to make us aware of potential disproportion between the passenger and the passage. X-ray pelvimetry has been utilized in all suspect cases. 2. Consultation is required in all cases of breech presentation, and the consultant must be present and act as an assistant at the time of delivery. 3. In the entire series of 500 cases, external version was not done, nor is it recommended by our staff. We feel that the low mortality rate obtained in our series could not be improved if we were to practice routine external version. The inherent dangers of the procedure might cause a higher mortality rate than that enjoyed at present. 4. Last, but of equal importance, is our conservative approach to the management of the delivery itself. In approximately 95% of our patients, delivery was accomplished by manual aid as defined by DeLee and Greenhill.[10] Only rarely is extraction attempted.

I have said nothing concerning the role of cesarean section in our series. This will properly fall into the province of the other authors in the series. However, we prefer to regard the primipara of 35 years of age or over as a potential candidate for section. Here again we call for consultation and discuss the pros and cons of the situation, thus mapping out our campaign even before the admission of the patient to the hospital.

It is difficult to separate the prenatal from the intrapartum care of the patient with breech presentation. It is our feeling that, if we are to continue to show as good results in the future as our figures would indicate for the past, we must continue along the lines that I have indicated. We must maintain an unflagging attention to a thorough study of the patient and her baby during the prenatal period, as well as to the careful and conservative conduct of her labor. Above all, we feel that our attitude toward early consultation and the use of the consultant as an assistant at the time of delivery are the prime factors in our low infant mortality rate in breech presentation.

953 Stuart Bldg.

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Chronic Adhesive Otitis Media.—[This] is a condition of the middle ear in which adhesions have developed as a result of previous infection. It is a major cause of deafness in about 30 per cent of the severely deaf. Adhesions may be formed where the inflammatory damage to the tissues exceeds a certain minimum, with the production of a fibrinous exudate, where the tissues of the host and the virulence of the organism react by rapid and powerful proliferation, and where there is some obstruction of drainage as by failure of the drum to rupture. If the inflammation subsides rapidly and conditions for re-pneumatization are favourable complete resolution may occur, while protracted or frequently recurring infections may leave permanent adhesions. In all cases of severe adhesive otitis media both fenestra will be found to be involved, also the head of the malleus and incus. Treatment of the established condition by eustachian inflation and pneumo-massage is quite ineffective, and results of fenestration operations have on the whole been disappointing. Prophylaxis may involve a change in attitude to chemotherapy in otitis media. It is our practice to paracentese and culture all cases, to repeat the paracentesis and supplement by suction where necessary, and to be prepared to do early cortical mastoidectomy in resistant cases.—J. P. J. MacNaughtan, Chronic Adhesive Otitis Media, *Journal of Laryngology and Otology*, October, 1956.

MANAGEMENT OF THE FIRST STAGE OF LABOR IN BREECH PRESENTATION

Robert A. Ross, M.D., Chapel Hill, N. C.

• *The death rate in breech-presenting babies is unexplainably high and can be lowered. The findings, the sequence of events, and the criteria of progress familiar in cephalic presentations are not completely applicable to breech presentations. One must sit with the patient, and progress must be judged by frequent rectal examination, auscultation, and abdominal palpation. The deliberate rupturing of the membranes and the administration of oxytocin are not recommended. The condition and effacement of the cervix must be correctly interpreted. Roentgenographic study of fetus and pelvis are almost routine. Prolapse of the cord is the complication most likely to cause fetal distress or intrapartum fetal death. A more thorough recording of the indications in each case of cesarean section would help to evaluate the usefulness of this operation in breech deliveries. Data on all fetal or maternal abnormalities associated with breech delivery are needed to help explain the death rate in this condition.*

During the first stage of labor in a patient with a breech presentation, the obstetrician can spend his time more profitably in observing the patient, checking the fetus, and reviewing the course of breech deliveries than in worrying about what is going to happen in the second stage. Intelligent watchful waiting and purposeful direction are more rewarding than injudicious interference and hopeful procrastination. It is sometimes difficult to determine accurately the onset and course of such a labor and often difficult to know when the first stage of labor has been completed.

Breech presentations occur in about 5% of pregnancies, and the factors that influence breech presentation have been well recorded.[1] The infant is likely to be premature, abnormalities of the fetus are more common than in normal presentation, frank breech is four or five times as frequent as footling presentation, and the infant's sacrum is usually in the left anterior position. Breech presentation occurs slightly more often in multiparas than in primiparas, is frequently accompanied by polyhydramnios, and the position of the placenta is characteristic. In all pregnancies the fetus often changes its position and sometimes its presentation. The chance factor occasionally causes the fetus to be found in a breech presentation when labor begins.

The consideration of external version is not within the scope of this discussion, but, if it has been attempted and failed or if the breech again presents with the beginning of labor, the increased chance of entanglement of the cord should be remembered. When the presenting part becomes fixed in the pelvis and labor pains are evident, it is difficult and unwise to use external version, because a definite, recorded fetal risk is chargeable to this procedure.

Many observers believe that breech presentation is always associated with dystocia, although Calkins[2] found little that was remarkable in the first stage of labor in his scrupulously recorded series. The findings, progress of labor, and criteria for test and trial of labor as applied in the presence of a cephalic presentation are not completely applicable to breech presentation. Early and frequent rectal examinations, frequent auscultation, and frequent and prolonged abdominal palpation must be done in order to evaluate properly the progress and adequacy of the first stage of labor. Certainly one must sit with the patient. Those who decry the abandonment of sterile vaginal examination during labor are on firm ground in the case of breech presentation. It is often difficult to measure cervical dilatation or even to locate the rim of the cervix without vaginal examination. Spontaneous rupture of the membranes occurs early in breech presentation, thus aggravating the pronounced molding of the uterus about the fetus, and extended legs tend to splint the fetus, all of which affects motility and flexion of the fetus. We of the department of obstetrics and gynecology of the University of North Carolina School of Medicine seldom deliberately rupture membranes in breech presentation, nor do we administer oxytocin injection (Pitocin) if the fetus is viable, although others have reported frequent use of both measures with no increased hazard.

The most favorable weight of the fetus is between 2,800 gm. (6 lb. 2 oz.) and 3,800 gm. (8 lb. 6 oz.). The perinatal death rate increases as the weight varies downward and upward from these figures. Major systemic complications and accidents during labor reflect unfavorably on the prognosis for the baby in breech deliveries and require thorough study. The obstetrician's management of these major complications could further jeopardize the fetus.

Roentgenographic study of fetus and pelvis in breech presentation is almost routine. The size, position, and maturity of the fetus, apparent anomalies, and to some extent the appearance of the fetal skull help in directing the first stage of labor and in anticipating further complications. The size of the fetal head cannot be determined accurately except by roentgenograms taken at some distance, but other features and the globular shape of the head can be noted.

During the first stage of labor, prolapse of the cord is the complication most likely to cause fetal distress or intrapartum death of the fetus. The diagnosis of this complication can best be made by vaginal examination, but the examiner must remember that manipulation tends to encourage prolapse of the cord. The treatment of this complication depends upon the condition of the cervix; if the cervix is fully dilated or

From the Department of Obstetrics and Gynecology, University of North Carolina School of Medicine.

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"dilatable," by Potter's definition, the fetus is delivered with the aids outlined by Potter and co-workers.[3] If the cervix is only partially dilated and the fetus adjudged viable, cesarean section should be done.

By definition, the first stage of labor ends when the cervix is completely dilated. Familiarity with and knowledge of the dilatation of the cervix was gained by those who practiced frequent internal podalic version. It would be most helpful if worthwhile information regarding the cervix, contraction and retraction rings, and the interior of the normal pregnant uterus could be gained without the known dangers to fetus and mother that must accompany the practice of elective podalic version. The undilated, or, more important, the uneffaced cervix, the one that does not "melt away," is the chief factor in both fetal and maternal morbidity and mortality in the mechanics of breech deliveries. Dilation of the cervix can be effected by incision, but one still has the impediment of a cervical sleeve that is aggravated by traction on the body of the breech-presenting baby and cannot be managed as well as in a cephalic presentation and forceps delivery.

Evaluation of Complications

We have much information regarding both mother and infant in breech presentation. We can evaluate the major complications of the pregnancy and interpret their significance in a specific patient.[4] One should know his own special capabilities and recall the vagaries of the pregnant uterus and behavior of fetal extremities; if the factors indicate cesarean section, the operation should be undertaken at once. We cannot increase our knowledge by overst ting a doubtful premise; recording diameters that have not been tried; or incorrectly explaining imponderables in mother, fetus, and the process of labor. There is perhaps a valid place for a frank but infrequent recording of the simple statement that one in good conscience believed that cesarean section offered the best hope for a live infant and healthy mother.

Most of the reports on breech deliveries do record the incidence of cesarean section, but in many it is difficult to check the number performed where breech presentation was the only indication for the operation. Surely many breech presentations merge with such categories as malposition, fetal distress, prolapsed cord, intrapartum hemorrhage, and dystocia due to disproportion. The data regarding breech presentation are further complicated by a common failure to record fully or, at times, even mention twin pregnancies in reporting series on breech presentations. All of these data would help explain the death rate in breech-presenting babies, a rate that all agree is unexplainably high and one that can be successfully lowered. Contemplation of all facts, together with care and attention during the first stage of labor, can influence favorably the varying figures given for fetal mortality in breech presentation.

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THE SECOND STAGE OF BREECH DELIVERY

Edward C. Hughes, M.D., Syracuse, N. Y.

Even the experienced obstetrician approaches a breech delivery with some fear and trepidation, knowing that the fetal and maternal morbidity and mortality rates are statistically higher in breech delivery than in other types of delivery. There is probably no obstetric condition that demands such thorough evaluation of the patient before labor and such careful obstetric judgment and skill during labor. In light of this, all the factors that influence the passage of the fetus through the maternal pelvis should be studied and understood. If careful and frequent examinations of the patient during the latter portion of gestation reveal a breech presentation, complete analysis of the case should be made prior to labor. If the diagnosis is not made until the first stage of labor has begun, certainly complete evaluation of the problem should

From the Department of Obstetrics, State University of New York Upstate Medical Center.

Read in the Panel on Breech Presentation before the Section on Obstetrics and Gynecology at the 105th Annual Meeting of the American Medical Association, Chicago, June 12, 1956.

• *Adequate study of mother and fetus before the second stage of labor improves the chances for a successful delivery in cases of breech presentation. Normal labor is anticipated if the pelvis is adequate, the fetus of normal size, the cervix completely dilated, and the delivery proceeding spontaneously under light anesthesia. The delivery of choice is a spontaneous one with assistance offered for the delivery of shoulders and head. Obstacles that arise will generally be at the breech, the body, the shoulders, or the head. For each, certain procedures exist, and the obstetrician should be prepared to apply them as needed. The rule that the time allowed for delivery of the head after the umbilicus has reached the vulva should not exceed eight minutes needs reconsideration. A slow methodical delivery, extending the time to perhaps 15 minutes, is less likely to injure the fetus permanently than is the application of excessive pressure or undue haste in placing forceps. Postpartum examination of the maternal soft parts should extend to the interior of the uterus. Understanding, skill, patience, and consultation will save many lives.*

be made immediately. Although complications may occur during the first stage of labor, the actual dangers arise at the time of delivery itself. One must be prepared to meet these dangers and prevent them whenever possible. Many things should be considered before the second stage has started, and anticipation of them will prevent many of the fatal accidents that make this presentation hazardous.

Factors Influencing Breech Delivery

Architecture of the Pelvis.—When a breech presentation is found during the last months of gestation, attention should be paid primarily to the size and shape of the pelvis long before the second stage of labor. This may be done by careful measurement of the diameters of the pelvis by the usual pelvimetry, by x-ray pelvimetry, or by sterile pelvic examination before or during labor. If the pelvis is found to be of normal size and shape, breech delivery should not be feared from this standpoint.

Contracted Inlet.—If the inlet of the pelvis is contracted, difficulties in labor may be imminent unless the fetus is small. Although no definite prediction can be made as to whether the fetus can pass through an inlet of definite, known contraction, certainly, if the diameters of the pelvic inlet are known, it will help to clarify the problem. If the true conjugate diameter is more than 9 cm., little difficulty should be anticipated unless an exceedingly large fetus is present. A true conjugate diameter between 8 and 9 cm. will give difficulty but will allow passage of a fetus weighing approximately 5 to 6 lb. (2,268 to 2,722 gm.). To attempt delivery through the pelvis when the true conjugate diameter is less than 8 cm. will surely be unwise and dangerous to both parties involved. In cases of contracted inlet the progress of the first stage of labor is generally slow and full dilatation may never be obtained. Therefore, the cervix, together with the contracted inlet, may play an important part in the progress of labor and in the decision of whether to deliver the fetus vaginally or by cesarean section. Cesarean section will be performed more often in cases of contracted inlet.

Midpelvic Contraction.—Contraction of the pelvis in the midplane, or forward displacement of the area of the sacrum from the junction of the second and third sacral vertebrae to the end of the sacrum, offers perhaps the most deceiving type of labor. The breech may descend to become engaged, but dilatation of the cervix may be slow or may become stationary. Ordinarily the pelvis is almost round at this point, and most of the mechanics of labor occur at these stations. The anteroposterior diameter averages 12.5 cm. at the level of the junction of the second and third sacral vertebrae; the transverse diameter at this point will also average 12.5 cm. At the lower end of this area, the distance from the symphysis to the end of the sacrum, together with the distance between the ischial spines, will indicate whether the passage of the fetus is possible. The fetus in breech position may descend into this area and allow the cervix to become dilated to approximately 3 to 4 cm. At this point dilatation of the cervix may become stationary. This should be a clue that contraction at this area is present and that delivery, particularly of the after-coming head, will be either impossible or extremely difficult. It is questionable in cases of contraction of the midpelvic area whether delivery should be attempted unless the progress of labor has proceeded quite normally and the fetus is small.

Outlet Contraction.—Contraction of the outlet of the pelvis may cause difficulty with the delivery of the breech itself but will particularly give trouble to the after-coming head. It is therefore necessary to evaluate the size of the outlet by measuring the transverse and the posterior sagittal diameters. The rule that the sum of the two should equal 15 cm. is a particularly good one to follow. If this measurement is obtained, it is fairly safe to say that a normal-sized fetus will pass through without difficulty. However, one must measure and consider the size of the outlet, because the first stage of labor generally proceeds without difficulty and unless the pelvis has been measured the obstetrician may attempt delivery without being aware of the contraction that is present.

Fetal Size.—Although the size and shape of the maternal pelvis is of extreme importance, one must not forget that the size of the fetus also alters the type of delivery. It is rather difficult to estimate the exact size of the fetus. However, consideration must be given to this point. Measurement of the distance from the symphysis pubis to the fundus of the uterus may give some idea as to the size of the fetus. If it measures over 36 cm., then one can expect an increased size of the fetus. This is particularly accurate if the amniotic sac has been ruptured. In some instances, palpation may give some idea as to the actual size and consistency of the head. X-ray determination of the size of the fetus may give important information, but it may be misleading. One must take this information with some reservation because the distance of the x-ray tube from the fetus itself may exaggerate or diminish the relative fetal size and actually give a fallacious estimation. The optimum size of the fetus to assure a successful passage through the maternal pelvis should be between 6 and 7 lb. (2,722 and 3,175 gm.).

There are certain kinds of damage that may occur to the fetus, large or small, that either may be lethal or may give only temporary difficulty. The incidence of damage depends upon the ability of the fetal tissue to withstand the strain of labor. In the fetus weighing less than 5 lb., the tissues are not developed sufficiently to withstand the process of delivery, while a fetus weighing more than 7 lb. may receive a greater amount of trauma during a difficult delivery. Such damage, which occurs during labor, should be differentiated from those plastic changes that may develop during pregnancy. For instance, shortening of one sternocleidomastoid muscle may develop because the head may be tilted to one side while in utero, so that one muscle may retract more than the other. This will cause temporary torticollis after birth. However, this must be distinguished from a hematoma, called a caput obstipum, that develops in the sternocleidomastoid muscle during labor from strenous pulling upon the shoulder while the head is still in the pelvis. Such a hematoma may result in actual

permanent shortening of this muscle on the affected side. Flattening of one side of the head may also develop while the fetus is within the uterus. This will be present at birth and will diminish after delivery.

During the second stage of labor, one of the more serious things that can happen to the fetus is breaking of the clavicle, which may result, in some cases, in the tearing of the brachial plexus. The abruption of the brachial plexus causes a paralysis of the upper or lower arm, or both arms, depending upon the extent of laceration. The most serious damage than can occur to a fetus is the tearing of the meninges within its head due to a distorted or excessive pressure upon the skull as it is forced through the pelvis. These membranes are ordinarily reinforced by fibers, so that the normal fetal head can withstand the pressure of labor. These supporting meningeal bands are fewer in number in the premature child, or fetus weighing less than 5 lb., than in the full-term infant. After these structures are torn, laceration of the sinuses within the skull occurs and excessive bleeding within the cranium results. Excessive trauma from pushing or pulling may cause such damage to occur in any type of delivery, but particularly when the fetus is excessively large.

Type of Breech Position.—The type of breech position may alter the course of labor during the second stage. A complete breech position, known as a double breech, in which the attitude of the fetus is one of universal flexion, is the safest type of breech presentation. When this type is presenting, more complete dilation of the cervix will be obtained. Both feet are accessible for manipulation, if this becomes necessary, and the process of labor seems to go on more normally.

The incomplete breech position, in which one or both feet protrude through the cervix and into the pelvis, gives a great amount of difficulty and uncertainty. When this situation occurs, the feet or even the thighs may protrude through the vulva. This may give the impression that the first stage of labor has ended and that the cervix is fully dilated. Many times the obstetrician, thinking this to be a fact, attempts to complete the delivery. If he has not examined the patient adequately, he will not be aware of the incomplete dilatation of the cervix. Incomplete dilatation results in extension of the arms, or the cervix may contract around the after-coming head. Therefore, the delivery should not be hurried and the patient should be allowed to expel the fetus spontaneously, at least to the level of the umbilicus.

The single or frank breech position is the most frequent and perhaps the most difficult. The legs are extended upon the thighs and the thighs upon the abdomen so that they are pressed against the body. This tends to splint the body and prevent it from executing the normal mechanics of labor that are necessary for delivery. There is also a greater opportunity for prolapse of the cord in this type of breech presentation, and it is more difficult to bring down the legs, if necessary, in this position of the breech.

Mechanics of Labor in Breech Presentation

One must understand the various steps in the mechanics of labor when the breech position exists. Most of the adaptive movements of the fetus occur during the second stage of labor. Descent is slow. Anterior rotation of the anterior hip to the symphysis, causing the sacrum to rotate laterally, occurs as the breech descends through the pelvis in the second stage of labor. Spontaneous expulsion of the fetus occurs by the anterior hip impinging against the symphysis pubis, acting as the fulcrum, and causing the posterior hip to be born by lateral flexion. This is the delivery of choice.

For normal mechanism of labor, analgesia should not be given excessively during the first stage of labor and the patient should be encouraged to push and deliver the breech spontaneously under light anesthesia. If this occurs, one can be assured that the cervix has reached complete dilatation and retraction and that there will be no trouble with the arms or the head. If the pelvis is adequate, and the fetus of normal size, one can anticipate normal labor.

One must always be prepared to step in and assist the patient when obstacles arise either at the breech, the body, the shoulders, or the head. Each location of the fetal body may present a problem. Generally, after the patient has expelled the body to the level of the umbilicus, assistance must be given in order to deliver the shoulders and after-coming head. It has been my experience that one should not twist or turn the body but should deliver the anterior shoulder first and then rotate the body without traction and deliver the opposite shoulder anteriorly. It is generally necessary to assist with the delivery of the after-coming head. Two ways of delivery, the Weigand-Martin method and the use of forceps on the after-coming head, seem to be the safest.

The Weigand-Martin method could be described as follows. The obstetrician's middle finger of either the right or left hand is placed in the mouth of the fetus. His index and ring finger are put upon the superior maxillary bone. This gives him control of the head so it can be rotated and engaged in the proper diameter of the inlet of the pelvis. The body of the fetus is straddled across the forearm of the operator. The operator's other hand is placed upon the patient's abdomen, where gentle pressure is exerted upon the fetal head. The coordinated motion of the hand in the baby's mouth and the hand on the abdomen engages the head in the diameter of the pelvis that it best fits. The head is then delivered by gentle pressure above the symphysis pubis while the internal hand causes extreme flexion, thereby admitting the smallest diameter of the head through the largest diameter of the pelvis.

If this maneuver is unsuccessful, or if it necessitates extreme pressure upon the head, it should be abandoned. In this case, one should resort to use of forceps on the after-coming head. They are safer, cause less trauma, and effect a successful delivery. The Piper forceps seems to be the most successful. It has long shanks, thin blades, and a bent handle that seems to be most adaptable for the procedure. After the fetal head has been fitted into the pelvis, the assistant holds the baby's body free from the operator, either by placing a towel around the body or by grasping the feet and arms. This allows the operator freedom of movement to insert the blades of the forceps into the vagina in the proper position on the fetal head.

It must be remembered that forceps should always be applied upon the abdominal side of the fetus. This causes flexion of the head, thereby enabling the smallest diameter to be brought through the pelvis. The left blade is inserted in front of the ears and the right blade is applied on the opposite side of the head. After the blades are locked, gentle traction is placed upon the head. The head is fitted into the largest diameter of the maternal pelvis. One must not just pull in any direction, but must fit the head into the pelvis. If rotation of the head occurs so that the chin rests behind the symphysis pubis, considerable difficulty will be encountered. In this situation the blades of the forceps are applied to the head on the abdominal side, which would mean the forceps would be on the top of the fetus.

After the head is brought down through the outlet of the pelvis and the mouth is visible at the vulva, the mouth should be sucked free of mucus and blood. There is no hurry for further extraction of the head at this point. If some difficulty is encountered at the outlet and the fetus attempts to aspirate material from the vagina, a Sims speculum can be inserted into the vagina and the vaginal walls freed from the fetal mouth. This allows free suction of the mouth and prevents the fetus from sucking in vaginal fluid.

In most cases it is wise to prepare the soft parts of the pelvis before delivery is attempted. If the breech has been adequately "crowned," the pelvic muscles will be stretched out quite satisfactorily. If not, permitting gentle ironing out of the perineum or incising it before delivery is advisable. While the perineum may be incised either in the midline or in its mediolateral aspects, it is generally wise to use the latter approach. An adequate episiotomy should be done.

Complications in Breech Delivery

Although we all wish for a spontaneous delivery of the fetus in breech position, unfortunately it does not always occur. We may have difficulty delivering any portion of the fetal body. The breech, the body, the shoulders, or the head may give us difficulty. One must be prepared to execute the various methods of delivering each individual unit in order to deliver the infant successfully. If the patient is not able to deliver the breech spontaneously, after a satisfactory amount of time, one must adopt measures to complete delivery. If the breech position is the complete type, and nature fails to deliver the fetus spontaneously, labor may come to a standstill. In this situation it may be indicated to bring down one leg of the fetus or possibly both legs. It must be remembered that the anterior leg must always be brought down first, or, better, both legs should be extracted.

To accomplish this, several things must be prepared: The patient must be adequately anesthetized, the patient's buttocks should be practically hanging over the end of the table, the obstetrician's hand should be lubricated properly (the hand opposite the small parts should be used), and the perineum should be incised before bringing down the foot and the leg. After all these criteria have been fulfilled, the operator inserts the hand into the lubricated vagina, grasps the anterior leg, and gently extracts it from the vagina. One must always be careful and examine for the presence of the umbilical cord between the legs; if it is there, it should be loosened. The hand is placed between the cord and the buttocks; the anterior leg is grasped, rotated, and brought down through the outlet. After this procedure, the umbilical cord will rise up into the pelvis and will not be caught in the process of delivery. If the umbilical cord is so tight that this procedure cannot be completed, the cord must be severed. In this situation, the fetus is more likely to take a breath while in utero.

If the position is frank breech with the legs extended upon the abdomen and labor comes to a standstill, the breech may be delivered in one of two ways: gentle pressure upon the fundus, with traction provided by inserting a finger in the fetal groins, may be used to effect delivery, or Pinard's maneuver may be used to bring down the legs and complete the delivery. When this maneuver is used, all the criteria for a breech delivery should be maintained. The hand is lubricated and inserted into the vagina and uterus; the thumb or index finger is placed in the popliteal space of the anterior fetal leg; and the leg is grasped and rotated medially, pressed against the fetal body, and brought downward and out. If the umbilical cord is between the legs, the hand should be inserted between the cord and the legs and the anterior leg should be grasped and brought down in the manner just described. In some instances it is better to perform Pinard's maneuver on both legs. It must be remembered that the anterior leg must be brought down first, so that the fetal back will not rotate posteriorly, causing the fetal chin to rotate behind the symphysis pubis and causing obstruction at this point.

Delivery of the Abdomen.—It must be remembered that damage to the fetal liver and adrenals can be done by excessive squeezing and traction upon the trunk during delivery. These lesions may result in death of the fetus. Therefore, one must protect the abdomen and the spinal cord from this sort of injury. The best way to do so is to wrap the trunk in a moist towel, place the thumb along the spinal column, and gently encircle the trunk with the fingers, using only a small amount of pressure. To cause the least amount of trauma, traction on the trunk should always be downward in line with the planes of the pelvis or perpendicular to the inlet. To direct traction in this manner, it is necessary to have the patient's buttocks hanging over the edge of the table. Twisting and turning of the trunk with excessive traction should be avoided.

Delivery of the Shoulders.—More babies are lost at the stage of delivery of the shoulders than at delivery of any other part of the body. Certain things must be remembered. The body of the fetus should be carefully brought down in the same plane in which delivery was started; rotating the fetus back and forth like a corkscrew should be avoided, since such maneuvers cause extension of the arms. One should place traction upon the body, causing the anterior shoulder to come underneath the symphysis pubis. The obstetrician then inserts several fingers beneath the symphysis pubis and brings the anterior arm of the fetus downward and

across the anterior part of the chest. The body is then rotated without traction in the opposite direction, so that the other shoulder comes to the anterior position.

Occasionally the shoulder cannot be rotated to the anterior position. In this case, the operator inserts his hand into the posterior portion of the vagina and grasps the fetal arm in this posterior position. The arm is then held while the body is rotated, which causes the shoulder to come to the anterior position. The anterior shoulder then will be brought down underneath the symphysis pubis. This may increase the extension of the opposite arm and will place it on the posterior aspect of the opposite side of the pelvis. When this occurs, the operator's other hand is inserted into the vagina, the fetal arm is grasped, and the body is rotated in the opposite direction. At the same time the arm is brought down across the chest and delivered. This method will solve the problem of delivery of the shoulders in most instances.

If the shoulders do not come readily into the pelvis, one must suspect extended arms or either a single or double nuchal hitch. Extension of the arms may be caused by hurried extraction of the breech, an undilated cervix, an excessively large fetus, or contraction of the pelvis. One must not pull and rotate in order to break up this condition. One must always insert the hand in the posterior aspect of the vagina, reaching up and grasping the extended arm in this location. The body is then rotated in such a fashion that the arm is brought down into the vagina as the body is rotated. The arm is not pulled upon, but is merely held. This will exaggerate the extension of the opposite arm but will bring it into the posterior portion of the pelvis. Therefore, the other hand is inserted into the vagina and the arm is grasped while the body is rotated in the opposite direction. In this event, this arm is brought down and delivered in the anterior aspect of the pelvis. This maneuver will always conquer this annoying complication. Deep anesthesia is called for, and the patient should be positioned well down on the delivery table. The physician must realize the seriousness of the situation as well as his own capabilities.

Delivery of the Head.—Few patients will deliver the head spontaneously. Therefore, it becomes necessary to give some aid to delivery of the after-coming head. The head has descended out of the uterine cavity and the uterus is no longer effective in providing the necessary expulsive force. The abdominal musculature in most cases is ineffectual because of anesthesia. Therefore, delivery of the head must be done by the operator. Various procedures are used for delivery of the head, but the Weigand-Martin maneuver seems the safest. However, if the delivery is not readily accomplished or excessive pressure is necessary, one should give up the Weigand-Martin method and should apply forceps to the after-coming head (see section on Mechanics of Labor).

Time Period for Delivery

Although it has been stated that eight minutes is the maximum time allowed for delivery after the umbilicus has reached the vulva, it is dangerous to follow such a rule. Considerable damage will be done, and has been done, if the operator feels that the time limit for delivery of the body is only eight minutes. It is far better to conduct a slow methodical delivery, disregarding time, than it is to damage the fetus permanently. It is safe to take as long as 15 minutes for the delivery of the head. After the mouth has come into view at the vulva, it should be sucked out, cleared of mucus and blood, and delivery of the head completed slowly and with ease. This spares the mother lacerations, and there is less danger for the fetal head.

Anesthesia

The proper choice of anesthesia is particularly important in breech delivery. It must be remembered that during the first stage of labor the patient must not be overmedicated. She must be able to expel the fetus spontaneously. Therefore, light analgesia should be used during the first stage. The choice of type of anesthesia is different in every hospital. In most cases nitrous oxide, cyclopropane, or the like would be the anesthetic of choice. It is perfectly safe to use caudal or saddle block anesthesia for breech delivery. However, caudal anesthesia should not be built up so that the patient cannot spontaneously expel the fetus. If properly timed, caudal anesthesia and saddle block anesthesia serve well for this type of delivery. Saddle block anesthesia must not be used before adequate "crowning" has occurred. If conduction anesthesia has been used, however, and it becomes necessary to perform a Pinard maneuver, additional inhalation anesthesia may be necessary, as the lower segment of the uterus will be exceedingly tense. Local pudendal block for spontaneous breech delivery is highly desirable and effective.

Examination of the Maternal Soft Parts

It should be absolutely imperative that the patient be examined thoroughly after all breech deliveries. Laceration of maternal parts, ruptured uterus, and tears of the cervical and vaginal sulcus are more evident in breech presentations than in other types. Therefore, the interior of the uterus, particularly the lower segment, should be examined by inserting the whole hand into the uterus. Likewise, a speculum should be inserted into the vagina, the anteroposterior lip of the cervix grasped with cervical tenaculae, and the cervix examined adequately for laceration. One will be amazed at the deep cervical lacerations that occur with this type of delivery. The lateral aspects of the vagina also should be inspected visually, and careful search should be made for other lacerations. If these lacerations occur, they must be repaired.

Conclusions

Most babies are lost during the second stage of labor in cases of breech presentation because inadequate study has been made of mother and fetus prior to this portion of the labor. Thorough knowledge of the structures involved, appreciation of one's own capabilities, patience for spontaneous delivery, and consultation will save many lives.

325 University Ave.

EFFECT OF THYROID HORMONE ON CIRCULATION

Henry M. Thomas Jr., M.D., Baltimore

• *Laboratory data from many different sources show that the rate of blood flow through various organs usually is not in proportion to their rate of oxygen consumption. The hemodynamic phenomena that accompany hyperthyroidism can therefore not be explained simply by saying that increased metabolic rate necessitates increased blood flow. The following hypothesis offers a more satisfactory explanation: The direct effect of the thyroid hormone in raising the metabolic rate is exerted mainly on such internal organs as the liver and kidney and to a lesser extent the voluntary muscles. Its effect in dilating the blood vessels of the skin is indirect and is really a response of the skin to the hyperthermia of the internal organs. The cutaneous vasodilation decreases the peripheral resistance in the vascular system; the heart then responds with a sufficient increase in rate to maintain a normal blood pressure within the aorta. This entails an increased volume of cardiac output per minute, increased rate of work by the heart, and ultimate embarrassment of the myocardium. In hypothyroidism, on the other hand, the initial change is a direct depression of the metabolic rate of the deep-lying organs; this lowers the body temperature, diminishes the need of radiation from the skin, results in cutaneous vasoconstriction, and so raises the peripheral resistance; in order to prevent a rise in the aortic blood pressure, the heart reduces its rate of output. Thus the circulatory system is confronted by the need of adjusting to imbalances of the thyroid hormone, and it reacts in ways that are sometimes beneficial, sometimes detrimental.*

Thyrotoxicosis is conspicuous because of its influence on the rate of the heart, and many of its most interesting symptoms originate in that organ. As early as 1786 Parry realized the connection between cardiac symptomatology and goiter, but to his mind the heart disease was the primary condition. He thought also that exophthalmos, which was present in his eight patients, was secondary to the heart disease. Even Graves, Stokes, and others in the mid 19th century were of the same opinion, and it was not until 1883 and 1885 that Kocher, and, independently, Horsley, recognized the part played in this syndrome by the thyroid hormone. In 1899 Kraus published in *Wiener klinische Wochenschrift* his concept of the so-called neurotic or thyrotoxic heart from which the current ideas have been developed.

At first, interest was centered entirely on the heart in hyperthyroidism. Did toxic diffuse (exophthalmic) goiter produce hypertrophy of the heart or merely dilatation? What, if any, were the gross and microscopic pathological changes in the heart? Years were spent studying hearts and heart muscle from patients with toxic diffuse goiter (Graves' disease) and from animals fed on thyroid extract. The results of all this work were largely on the negative side. Today few if any pathologists claim that prolonged excesses of thyroid hormone, whether endogenous or exogenous, cause visible microscopic changes in the myocardium. Dilatation of the heart is widely admitted, but proponents of work hypertrophy still lean on scanty evidence.

Later, as cardiological studies were extended to include determinations of blood pressure, blood volume, and blood flow, the circulatory changes were measured also in cases of thyrotoxicosis. Here the yield of interesting facts was good from the first and has continued to be so up to the present time. Recently much new information has been provided, but even today answers have not been agreed upon to such simple questions as: What is the mechanism in hyperthyroidism leading to tachycardia and subsequently to auricular fibrillation? Through what homeostatic mechanisms do the various circulatory changes develop?

When one examines a patient with pronounced thyrotoxicosis, after noting the exophthalmos, tremor, and signs of loss of weight, one is struck by evidence of involvement of the cardiovascular system.[1] In the neck one sees active pulsation in the carotid artery. The pulse is rapid, full, and bounding; the apex impulse is rapid and forceful and is apt to be felt slightly further toward the axilla than normally. At the apex the heart sounds are overactive, the first sound is loud and often abrupt, and there may be an apical systolic murmur and, rarely, a not very loud slightly crescendo presystolic murmur. At the base not infrequently a systolic murmur is heard over the second and third left interspaces, which may have a suggestive rubbing quality,[2] and this is increased in intensity by pressure with the bell of the stethoscope. This murmur may be related to dilatation of the pulmonary conus, which frequently is seen in fluoroscopic and x-ray examinations of these patients. Systolic blood pressure is slightly raised and diastolic pressure lowered, giving an increased pulse pressure, which accounts for the bounding pulse and visible increase in the systolic excursion of the carotid arteries while maintaining a normal mean pressure. Pulsations of the liver and even of the spleen have been observed.

These signs bespeak an overactive heart. In patients past 40 years of age or suffering from coronary artery or rheumatic heart disease, auricular fibrillation frequently ensues. A plausible theory has been advanced for the development of this and some other types of arrhythmia occurring in thyrotoxicosis. The presence of small areas of ischemia in the muscle of the auricle secondary to coronary vascular disease could induce fibrillation in a heart that is overactive from thyrotoxicosis.[3] When angina pectoris occurs in these patients, signs of thyrotoxicosis usually are less

From the Department of Medicine, Johns Hopkins University, and Medical Service of the Johns Hopkins Hospital.

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prominent or obvious than in other cases and the attacks of pain cease after the hyperthyroid state has been relieved.[4]

In the 1920's Robinson headed an already distinguished group—Burwell, Blalock, and Harrison—in exploring the problems of circulation and the physiology of cardiac output. It was found that in thyrotoxicosis the blood volume is increased, the cardiac output increased, the blood flow accelerated, and the skin capillaries dilated.[5] In these respects the heart of a patient with thyroid disease was similar to the heart of the patient with vitamin deficiency or beriberi, but reasons for these changes were not apparent.

Studies of Hyperthyroid and Normal Animals

In an effort to elucidate these facts, many observations have been made of the effect of thyroid extract on the circulation and on the metabolism of the myocardial cells of animals. All attempts to alter cellular activity or metabolism by exposure to thyroid extract in vitro failed completely. More conclusive information was gained through comparison of the metabolism of tissues removed from hyperthyroid and normal animals. Rohrer [6] found increased oxygen use in intact organs (liver, kidney, muscle) from white mice fed thyroid. In animals, after an injection of 1 mg. of thyroxine, Dresel,[7] using the Warburg method, found large increases in oxygen consumption of liver and moderate increases in oxygen consumption of kidney tissue. McEachern [8] made direct measurements of the oxygen consumption of isolated beating auricles from normal guinea pigs and those with thyrotoxicosis by means of a modified Barcroft-Warburg microrespirometer. In 31 experiments on normal auricles and in 15 experiments on auricles from animals with thyrotoxicosis, the latter preparations were found to have a higher rate of oxygen consumption (7 to 20%) than preparations of similar weight from normal animals. He also observed [9] that, in white rats who had received multiple injections of thyroxine, tissue respiration was increased 46% for kidney, 73% for liver, and 75% for muscle of the diaphragm.

Gordon and Heming [10] in their study with use of rat tissues gave 20 mg. of thyroxine per kilogram of body weight by injection on two successive days. After a latent period of 48 hours, liver, kidney, diaphragm, and heart muscle, in that order of magnitude, showed increases in oxygen consumption, reaching a peak on the fourth day: liver 62%, kidney 37.8%, and diaphragm 28%; but the heart muscle reached a maximum of 24% on the third day and consumption fell off rapidly on the fourth day. Tissue from brain and spleen showed no increase in metabolism, and, of the tissues showing increased oxygen consumption, the kidney was the only one to develop an increase in respiratory quotient.

Tachycardia, once provoked in the intact animal (rabbits) by thyroid feeding or thyroxine injection,[11] persists in the isolated perfused heart and isolated perfused auricles and increases far more than normally on addition of epinephrine to the perfusate. The general picture, after a latent period of 12 to 48 hours, is one of persistent increased heart rate and increased oxygen consumption of both the beating and the quiet heart muscle, clearly demonstrating the direct effect of the thyroid hormone on the action and metabolism of the heart muscle as well as on the general body metabolism.

When one attempts to explain tachycardia in hyperthyroidism as the direct effect of thyroxine on the myocardium alone, one encounters certain difficulties. The oldest known one of these is the fact that, in cases of heart block in man, hyperthyroidism induced by feeding up to 28 grains (1.8 gm.) of extract daily fails to change the slow ventricular rate, although the basal metabolic rate becomes elevated and the auricular rate may rise from 70 to 120 beats per minute.[12] Also, a few years ago cardiac catheterization at the coronary sinus in a hyperthyroid patient yielded no evidence of increased oxygen consumption in the left ventricular heart muscle.[13] When this was repeated last year by other investigators,[14] however, the coronary blood flow in eight patients with hyperthyroidism was found significantly increased while the arteriovenous oxygen differences remained constant, thus revealing an accelerated myocardial oxygen consumption. After effective treatment with radioactive iodine (I^{131}) in these cases of hyperthyroidism, the cardiac output, cardiac work, coronary blood flow, and myocardial oxygen consumption returned to normal.

In rats made hyperthyroid with desiccated thyroid powder, Ullrick and Whitehorn [15] found respiration increased 77% in resting atrial, 22% in resting ventricular, and 33% in diaphragmatic muscle, while in skeletal and smooth muscle there was no increase. This difference in utilization of thyroid extract between auricle and ventricle may help to explain, in cases of heart block, the lack of response of the ventricle to thyroid extract, which is no longer controlled by the more sensitive auricle. Using a different technique, with sliced tissues from rats injected with one large dose of thyroxine, Barker and Klitgaard [16] obtained a quicker and larger proportional increase in oxygen utilization by left ventricular muscle than by any other tissues, while brain, spleen, and testis showed no increase.

These observations made on surviving tissue from laboratory animals rendered hyperthyroid by injecting or feeding thyroid hormone cannot be compared with any degree of confidence to the activity of similar tissues in patients suffering from toxic diffuse goiter. They do, however, fit generally the facts that are being learned about circulatory changes in hyperthyroidism. The difference of oxygen utilization between various organs, and particularly between atrial heart muscle and ventricular heart muscle, has far-reaching implications.

Blood Flow and Oxygen Consumption in Hyperthyroidism

Recent studies made by Stead and co-workers [17] in 18 hyperthyroid patients estimated blood flow and oxygen consumption of the liver or the brain or the kidney in comparison to total cardiac output and body metabolism. Measurement of the rate of removal from the blood stream by the liver of sulfobromophthalein (Bromsulphalein) by catheterization of the hepatic vein gave results that, by applying the Fick principle, indicate that the hepatic blood flow is increased very slightly in hyperthyroidism and in some cases not at all, whereas the oxygen consumption of the liver is

increased disproportionately. Further studies using improved techniques, which should give more accurate measurements, may change these figures, but it seems probable that the basic facts will find confirmation.

In nine other patients with hyperthyroidism, it was found by the nitrous oxide technique that none of the cerebral metabolic functions varies significantly from the normal in this disease. Cerebral blood flow and oxygen utilization remain unchanged in hyperthyroidism,[18] although both had previously been shown to be lowered in myxedema. The renal blood flow is somewhat increased in hyperthyroidism and somewhat diminished in hypothyroidism. Blood flow to the skin is greatly increased. Cardiac output, or total blood flow, is increased proportionately much more than total body metabolism. Thus, in hyperthyroidism the overall arteriovenous oxygen difference actually represents an average of excessive rate of oxygen withdrawal in some tissues (splanchnic), a reduced rate in others (skin and possibly muscle), and an unchanged rate in still others (brain and heart muscle).

Formerly it was believed that blood flow to an organ was increased or decreased to compensate for the changing metabolic demands of that organ. In the light of present knowledge this theory no longer is tenable. For instance, in hyperthyroidism the metabolic level in the liver is much higher than in other organs, yet the blood flow is roughly within normal limits. On the other hand, the metabolic rate in the brain is not increased nor is the blood flow altered. Peripheral blood flow is increased and is greatly out of proportion to increase in metabolism, whereas renal blood flow is moderately increased and there is evidence of only moderate increase in renal cell metabolic rate. The increase in total cardiac output is greater proportionately than the increase in total metabolic rate. One major and extremely important function thus accomplished is the provision of additional blood flow for transport of the increased body heat to the skin surface. Heat regulation depends in large measure on neurocirculatory reflexes. Thus we see that the increased blood flow in toxic diffuse goiter, which by measurement is proportionately greater than the body metabolism, provides, and provides accurately, for loss of excessive body heat. This important balance could hardly be accomplished in toxic diffuse goiter by the slowly acting direct effect of thyroid hormone on the circulation by way of the auricular heart muscle or elsewhere when the production of this hormone is clearly out of normal control.

From these observations one can assume that the increased blood flow in hyperthyroidism, which goes predominantly to the skin and possibly also to the skeletal muscles, is regulated in order to provide for heat loss through the skin. The increased oxygen requirement is satisfied, in the splanchnic organs for instance, if not necessarily in muscle, by more complete oxygen removal from the blood in passage. (This relative short supply of oxygen to the liver has been postulated as the cause of the central necrosis seen in the liver of some patients with thyrotoxicosis.[19])

Whether there is increased blood flow to the resting skeletal muscles, which in hyperthyroidism may be merely a by-product of increase to the skin, or whether, as seems more likely, such an increase serves a useful function, is not clear. Muscular weakness has long been recognized as part of the clinical picture of hyperthyroidism. Although the intimate action of thyroid hormone on cellular metabolism is not established, current concepts hold that it may act by uncoupling oxidative phosphorylation, leading to inefficient oxygen consumption and impaired use of energy sources important for contractile processes.[20] Thus it is postulated that some such metabolic defect in the myocardium may contribute significantly to the development of heart failure when it occurs in thyrotoxicosis.

Response of Heart in Hyperthyroidism

These circulatory changes all afford proof of the increased load borne by the heart in hyperthyroidism. The constant maintenance of an increased flow of blood by a heart whose muscle cell reserve energy supply may be impaired and whose rapid rate robs it of most of its usual rest period during diastole, constitutes a strain that challenges the underlying normality of the myocardium.

Peculiarities of the cerebral blood vessels prevent such wide swings of blood flow as are common in the splanchnic and peripheral circulation. To a lesser extent the same holds true for the coronary arteries. As we have seen, however, neither of these areas can spare itself from the effects of the reduced blood flow resulting from hypothyroidism and myxedema.

In evaluating the circulatory changes seen in hyperthyroidism, we may recall certain observations on normal circulatory variations. Hamilton[21] says that "cardiac output seems to be regulated as the summation of the demands for blood by the several organs of the body, each in control, so to speak, of its own blood supply." For example, the normal cardiac output can change from a resting figure of about 6 liters per minute to a value of perhaps 15 in mild exercise, brought about mostly by an increase in rate. After hemorrhage, cardiac output may be reduced to half or less of the resting figure. Meanwhile these fivefold changes in cardiac output may be present with blood pressure changes, which are relatively small and are held in balance by alterations in peripheral resistance.

The three main forces governing circulation—cardiac output, arterial pressure, and peripheral resistance—are interdependent. When any of these is held constant, say arterial pressure, then the usual variations occurring frequently in the circulation are brought about by a balanced change of the other two, namely output and resistance. This is usually expressed by the formula C. O.=P/R.

If the state of peripheral resistance is the pivotal factor, as Hamilton and other physiologists believe, around which blood flow (including, of course, heart rate and stroke volume) must vary while maintaining satisfactory blood pressure, then this is the area primarily involved in hyperthyroidism and/or hypermetabolism. Local demands are answered by local dilatation of the arterioles, with consequent increase in blood supply. "This," says Hamilton, "is mainly in response to local chemical influences and is dependent, to little or no degree, upon reflex adjustment of vascular tone. [It appears that this generalization may not be applicable to thyrotoxicosis.] When we become

over-heated, [however] hypothalamic reflexes are activated which cause cutaneous dilation and heat is dissipated. Both of these vasodilator mechanisms are prepotent, that is will hold vessels open in spite of vasoconstrictor outflow from the medulla." Because the circulatory changes taking place in hyperthyroidism are far from simple, the facts as known today are certainly subject to misrepresentation. We must remember, also, that there are elements of emotional tension that introduce nervous and hormonal stimulation of the heart as well as of the peripheral vascular system. The results of all of these direct stimuli call forth activity on the part of many reflex homeostatic mechanisms, including the arterial stretch receptors (i. e., carotid sinus).

Homeostasis, as Cannon conceived it, is achieved by methods of balance provided by innumerable physical, chemical, and biological rheostats. It is obvious that conflicts between these systems are continuous. In each equation the imbalance most threatening to survival must be given priority in the attempt to restore normality. Arterial blood pressure must be maintained to ensure satisfactory circulation. Therefore in thyrotoxicosis, even if accurate control of body temperature is the important factor that initiates homeostatic changes in the circulation, these changes can occur safely only if they permit the maintenance of arterial blood pressure adequate to perfuse essential organs. It is at this point that the heart responds reflexly to maintain the balance. With these facts in mind, some of the detrimental effects of circulatory changes in thyrotoxicosis can be more readily understood.

Myxedema

In many ways the circulation in myxedema presents a mirror image of that in toxic diffuse goiter. Results of studies are usually confused by the presence of complicating conditions such as old age, anemia, or actual coronary artery disease. The case of one young female patient (aged 21) with apparently uncomplicated myxedema from a group of five studied by Ellis and co-workers,[22] with use of the venous catheter and direct Fick method, may provide the best example of the effect of thyroid deficiency on otherwise normal circulation. The alterations that were corrected later by replacement therapy were (1) increased peripheral resistance (threefold), (2) increased pulmonary resistance (twofold), (3) cardiac output lowered (nearly threefold) beyond the degree of lowered oxygen need (−20%), (4) reduced stroke output (threefold), (5) increased heart size (2 cm. in transverse diameter in the orthodiagram), (6) diminished blood volume (1,000 cc.), (7) increased arteriovenous oxygen difference (more than twofold), (8) narrowed femoral artery pulse pressure but unchanged mean pressure, and (9) low voltage in the electrocardiogram. Remaining normal, in this particular case, were pulse rate, circulation time, pulmonary artery pressure (even after exercise), right auricular pressure, and venous pressure.

Here again change in total body metabolism cannot account for the large reduction in blood flow. On the other hand, the degree of increased peripheral resistance compares with that of blood flow, while mean arterial pressure remains the same. Since in this case the pulse rate remains the same, the lowered cardiac output is accomplished by lowered stroke volume. Electrocardiographic changes did not develop after one month of thyroid deprivation. Circulation time may be normal or even relatively increased through certain viscera while being reduced through the skin. By the usual methods of measurement, it has been found reduced in most cases of myxedema. Cardiac enlargement may represent weakened myocardium from thyroid deficiency or may be part of the general new circulatory balance and account, at least in part, for the reduced blood volume. The increased arteriovenous oxygen difference is produced by reduction in blood flow, which is greater than the reduction in oxygen consumption. Lowered blood flow to the skin, with vasoconstriction and increased resistance, seems to constitute the initial change in the circulation in myxedema.

Conclusions

When one reviews the facts that are currently known concerning the changes produced in the circulation of the human being by hyperthyroidism and hypothyroidism, one reaches a somewhat surprising hypothesis. Triggered by change in body temperature, produced by the increase or decrease in metabolism, the homeostatic neurocirculatory mechanism provides for change of blood flow to the skin by vasodilation or constriction. From the ensuing change in peripheral resistance, cardiac output is reflexly increased or diminished, with tachycardia and/or increase in stroke output, or the opposite, while mean arterial blood pressure is preserved in its normal range. The fact that the myocardium shares in the general metabolic effect of the thyroid hormone contributes no doubt to the maintenance of the new level of circulatory performance.

Various viscera appear to function at different metabolic levels. Their varying oxygen needs seem to be satisfied in some cases by increased blood flow and in others by increased oxygen withdrawal from a more or less constant blood supply. Different organs and tissues respond to excess of thyroid hormone with various levels of metabolic rate. This probably reflects similar degrees of varying utilization of the hormone under normal conditions. Confronted by the difficulties of adapting to imbalance of this particular hormone, the circulatory system reacts in ways that are in some cases beneficial and in others detrimental.

1201 N. Calvert St. (2).

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THERAPEUTIC PROBLEMS IN DIABETES INSIPIDUS

Edward C. Clark, M.D., Henry W. Dodge Jr., M.D.
and
Raymond V. Randall, M.D., Rochester, Minn.

Diabetes insipidus as seen in experimental animals after cutting the supraopticohypophysial tracts usually passes through three phases. This explains some phenomena seen in human subjects. In the first case here described, surgery in the vicinity of the optic chiasm was followed (a) by a polyuria of 27,930 cc. in 24 hours, then (b) by a gradual return to normal urinary output at about the sixth day, and finally, after about three days of normal output, (c) by establishment of a permanent phase of diabetes insipidus amenable to treatment with vasopressin tannate. Animal experiments suggest that the interphase (b) can be explained as meaning a transient outpouring of antidiuretic hormone by the detached, degenerating posterior lobe. The permanent phase (c) then represents exhaustion of the antidiuretic material from the posterior lobe. Severe diabetes insipidus is known to occur only in the presence of a functioning anterior pituitary lobe. In the third case here described, a polyuria had existed for more than six years in the presence of signs of hypophysial disease. A spontaneous amelioration of the polyuria was then noted concurrently with signs that the anterior lobe was failing; the polyuria returned after treatment with cortisone was begun. Spontaneous remission in a long-standing case of diabetes insipidus should alert the clinician to the possibility that the anterior lobe of the hypophysis is becoming involved in the disease process.

For a number of years it has been known that destruction in animals of certain portions of the supraopticohypophysial system, which connects the supraoptic and paraventricular nuclei and others cells in the hypothalamus to the posterior pituitary gland by way of the median eminence and pituitary stalk, may produce three phases of fluid intake, urinary output, and urinary specific gravity [1] (fig. 1). Immediately after section of the supraopticohypophysial tracts in the median eminence or hypothalamus, the animal enters the transient stage of diabetes insipidus, with rapid development of polydipsia, polyuria, and low urinary specific gravity. This is followed by the interphase, during which the fluid exchange and urinary specific gravity are normal. The permanent stage of diabetes insipidus, with elevated water exchange and low urinary specific gravity, then develops, and the animal is in a state of chronic diabetes insipidus.

First suggested by Dandy [2] and since confirmed by others,[3] this triphasic curve of water metabolism, namely, the transient stage, interphase, and permanent phase, may occur during the onset of diabetes insipi-

From the Section of Neurology (Dr. Clark), the Section of Neurologic Surgery (Dr. Dodge), and the Section of Medicine (Dr. Randall), Mayo Clinic and Mayo Foundation. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

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dus in human beings as well as animals. Figure 2 represents the fluid intake, urinary output, and urinary specific gravity of a 50-kg. (110-lb.), 9-year-old boy who was operated on for an intracranial chordoma in the region of the optic chiasm. Polyuria developed within a few hours after the operative procedure, and the urinary volume reached its maximal amount of

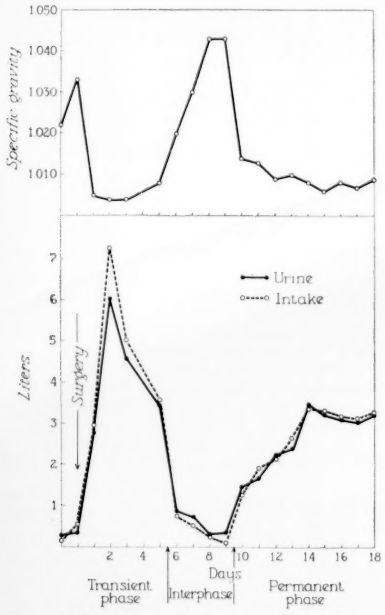

Fig. 1.—Intake of fluid, output of urine, and specific gravity of urine in a dog, after sectioning of the supraopticohypophysial tracts in the median eminence and severance of the pituitary stalk (data from Mudd[5b]).

27,930 cc. for a 24-hour period on the day after surgery. In spite of the tremendous urinary output and the even larger fluid intake (29,820 cc.) at this time, the patient's fluid exchange and urinary specific gravity returned to normal on the sixth postoperative day, thus ending the transient phase of the diabetes insipidus. The interphase of normal fluid exchange and fairly high urinary specific gravity lasted three days, when it was terminated by the onset of the permanent phase of diabetes insipidus. This permanent phase was ameliorated by vasopressin (Pitressin) tannate. Although preoperatively it was felt that the patient was not suffering from anterior pituitary insufficiency, he was given cortisone as a precautionary measure both during the surgery and throughout the postoperative period covered by this report.

As previously mentioned, one cause of the transient phase of diabetes insipidus is the complete or partial [4] anatomic severance of the distal portion of the supraopticohypophysial system from its proximal portions. However, the exact mechanism of this temporary period of increased water turnover is, as yet, unknown. While not yet adequately studied in man, the interphase of normal fluid exchange that follows the transient phase of diabetes insipidus has been demonstrated in animals to be due to an excess of antidiuretic activity in the body.[5] It has been postulated that this excessive antidiuretic activity is due to the uncontrolled release of antidiuretic hormone from the degenerating detached posterior pituitary gland or other portions of the neurohypophysis.[5c] The permanent stage of diabetes insipidus that terminates the interphase period is evidence that there is not sufficient available antidiuretic material remaining in the body to prevent the development of polydipsia, polyuria, and low urinary specific gravity.

While this triphasic curve of fluid exchange and urinary specific gravity may occur during the onset of diabetes insipidus, it should be emphasized that this is not always the case. Other modes of onset of diabetes insipidus occur in man and animals, but, since they are beyond the scope of this paper, they will not be discussed. The recognition that this triphasic curve of fluid exchange and specific gravity may occur in human beings during the development of diabetes insipidus following intracranial surgery and other lesions in the region of the hypothalamus and the pos-

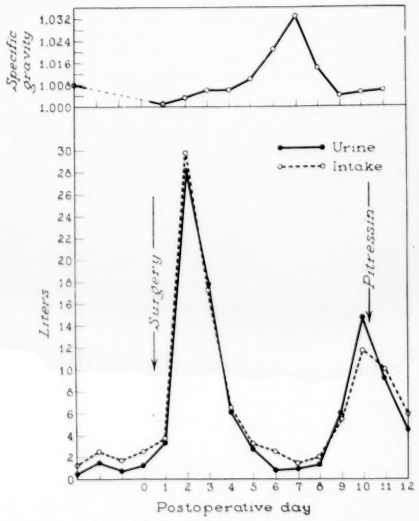

Fig. 2.—Intake of fluid, output of urine, and specific gravity of urine in 9-year-old boy after excision of intracranial chordoma in region of hypothalamus.

terior pituitary gland has been of value in understanding the physiology of the disorder. This, in turn, has raised certain questions concerning therapy, three of which we should like to discuss.

Should the Transient Stage of Diabetes Insipidus Be Treated with Vasopressin?

Polyuria during the transient phase of diabetes insipidus may reach its peak within two days and may not last more than four or five days. Consequently, the transient phase may be so short that it is often not necessary to give antidiuretic hormone during this time, as shown in figure 2. This is particularly true if the patient is conscious and is able to drink sufficient fluids to cover the urinary output. Should the patient be unconscious or the fluid intake requirements so high as to make the patient acutely uncomfortable, it may be desirable to use vasopressin during this initial period of four to six days. At the end of this time, however, one might wish to discontinue the use of vasopressin to see whether an interphase period has developed, thus helping to prevent a possible overloading of the body with an excessive quantity of unneeded antidiuretic hormone. If such a period of normal fluid exchange has begun, no more vasopressin will be needed, unless permanent diabetes insipidus develops. Should no interphase occur and the fluid exchange continue at high levels, it may, of course, be desirable to resume the use of vasopressin.

Can the Interphase of Diabetes Insipidus Be Mistaken for a Permanent Return of Normal Fluid Exchange?

As is shown in figure 2, the interphase of diabetes insipidus may begin about the fifth or sixth postoperative day. While the duration of the interphase is somewhat variable, it often lasts through the eighth postoperative day. During this period the patient's fluid exchange appears to be normal, although permanent diabetes insipidus will follow.

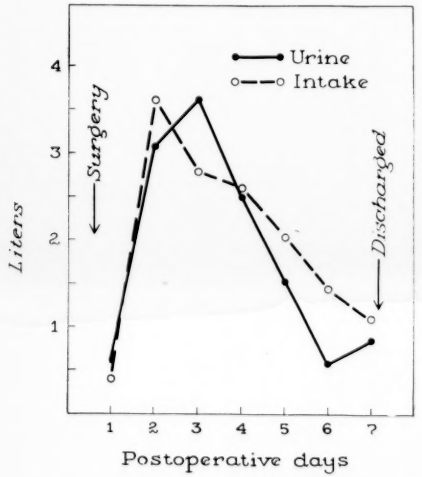

Fig. 3.—Fluid intake and urinary output in 9-year-old girl in whom polyuria and polydipsia developed after intracranial operation for removal of suprasellar teratoma.

Figure 3 illustrates the fluid intake and urinary output of a 9-year-old girl in whom polyuria and polydipsia developed after an intracranial operation for the removal of a suprasellar teratoma. After a period of transient diabetes insipidus the patient's fluid intake and urinary output returned to normal, about the sixth postoperative day. On the seventh postoperative day, when the patient was discharged from the hospital, her fluid exchange still appeared to be normal, and it was assumed that she had recovered from the diabetes insipidus. However, two days after leaving the hospital she returned, complaining of excessive thirst and the excretion of large quantites of urine. She was then given vasopressin, which controlled the polydipsia and polyuria satisfactorily. Thus, it is apparent that this patient's fluid exchange was in the interphase of diabetes insipidus at the time she was discharged from the hospital, the permanent phase of diabetes insipidus developing after she left the hospital. Hence, we feel that the interphase may be mistaken for the permanent return of normal fluid exchange unless the patient is observed for an adequate time.

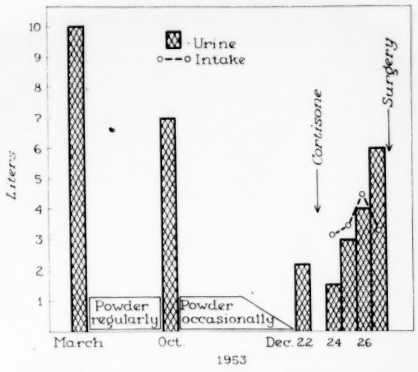

Fig. 4—Fluid intake and urinary output of 31-year-old woman in whom pituitary insufficiency developed secondary to cystic chromophobe adenoma of pituitary gland.

What Is the Significance of the Disappearance of Polyuria and Polydipsia After Diabetes Insipidus Has Reached the Permanent Stage?

When the fluid intake and urinary output of a patient who has permanent diabetes insipidus return to normal, it is often assumed that the disease process causing the diabetes insipidus has undergone a remission and that an antidiuretic substance is being produced in adequate amounts somewhere in the body. However, such an assumption cannot be made safely without investigation of the function of the anterior pituitary lobe. As has been known for a number of years, severe diabetes insipidus occurs only in the presence of a functioning anterior pituitary lobe.[6] Conversely, the development of anterior pituitary failure will cause an apparent partial or even complete clinical remission of the polyuria and polydipsia. Since no

diuretic hormone has been demonstrated in the anterior pituitary lobe, it has been suggested that the diuretic effect is mediated indirectly by the hormones of this gland through its various target glands.[7] Studies by Winter and co-workers,[8] Leaf and co-workers,[9] and others have suggested that the amelioration of diabetes insipidus in association with the onset of failure of the anterior pituitary lobe may be due to a decrease of urinary solids secondary to the reduction in food intake resulting from the generalized metabolic decline that accompanies failure of the anterior pituitary lobe. However, this problem still awaits final clarification.

The amelioration of diabetes insipidus in association with anterior pituitary insufficiency is illustrated by the following case report.

A 31-year-old woman was first seen at the Mayo Clinic on Dec. 19, 1953, because of intermittent headaches of 12 years' duration and failing vision of a month's duration. Six years before her admission the patient had noted, after an attack of influenza, a marked increase in urinary output and thirst. The diagnosis of diabetes insipidus was made in March, 1953, nine months before her admission, when her urinary volume for a 24-hour period was found to be 10,000 cc. The polyuria was satisfactorily controlled by insufflations of posterior pituitary powder.

At that time her basal metabolic rate was found to be −24, and she was given desiccated thyroid. In October, 1953 (two months before her admission to the clinic), she discontinued the regular insufflations of posterior pituitary powder, feeling that this medicament was the cause of the amenorrhea that recently had developed. After she stopped the use of the posterior pituitary powder, the 24-hour urinary volume was found to be 7,000 cc. From that time on, she required progressively less posterior pituitary powder in order to keep her urinary output at normal levels. The amenorrhea continued.

On Dec. 22, 1953, four days after her last dose of posterior pituitary powder, the 24-hour urinary volume was 2,630 cc. The urinary specific gravity from Dec. 21 to 24, 1953, varied from 1.004 to 1.013. On Dec. 22, the 24-hour urinary excretion of 17-ketosteroids was 2.1 mg. (normal, 4 to 17 mg.), and corticosteroids, 0.77 mg. (normal, 0.3 to 1 mg.). No estrogens or pituitary gonadotropins were found in the urine. A basal metabolic rate was −5, but the patient had been taking desiccated thyroid until the previous day.

On Dec. 23, 1953, transient sterile meningitis developed and persisted for two days, during which time the patient was acutely ill. The meningitis was thought to have been secondary to leakage of material from a pituitary cyst into the subarachnoid space. Since it was apparent from a clinical and laboratory standpoint that the patient was suffering from partial insufficiency of the anterior pituitary lobe, since an intracranial operation for the removal of a pituitary tumor was planned, and since the patient was acutely ill, she was admitted to the clinic and given 200 mg. a day of cortisone intramuscularly for one week.

As is shown in figure 4, the patient's urinary volume reached a low of 1,500 cc. per 24 hours on Dec. 24, 1953, the day after the administration of cortisone was begun. However, the next day her urinary output began to rise and continued upward until Dec. 27, when she excreted 6,000 cc. of urine. The next day a large cystic chromophobe adenoma of the pituitary gland was removed during an intracranial operation. Five days after the operation, on Jan. 2, 1954, her urinary volume had reached 12,250 cc. At this time, she was given vasopressin in oil, and the polyuria terminated.

In this case the amelioration of diabetes insipidus of six years' duration occurred in the presence of anterior pituitary insufficiency. Thus, the disappearance of the symptoms of diabetes insipidus may not represent a benign process but should alert the clinician to the possibility that anterior pituitary failure may be developing from destruction of the anterior pituitary lobe by a tumor or other causes.

Summary

A triphasic curve of fluid exchange and specific gravity may occur during the onset of diabetes insipidus in both animals and human beings. Recognition of the three phases of water metabolism, namely, the transient stage, interphase, and permanent phase, during the development of this disorder raises certain therapeutic questions. A clear understanding of the variations in fluid exchange during these three phases is of help in the management of certain patients with diabetes insipidus.

200 First St. S.W. (Dr. Clark).

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5. (*a*) Footnote 4*b*. (*b*) Mudd, R. H.; Dodge, H. W., Jr.; Clark, E. C.; and Randall, R. V.: Experimental Diabetes Insipidus: Study of Normal Interphase, Proc. Staff Meet. Mayo Clin., to be published. (*c*) O'Connor, W. J.: Normal Interphase in Polyuria Which Follows Section of Supraoptico-hypophysial Tracts in Dog, Quart. J. Exper. Physio. **37**:1-10 (Feb.) 1952.

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Roentgen Rays.—Röntgen was as modest and self-effacing as he was exacting and thorough. . . . The only public address he ever delivered on his discovery was before the Physical-Medical Society of Würzburg on January 23, 1896, where he suggested that the new rays be called "x" rays thereby utilizing the algebraic symbol for the unknown. At this same time, however, von Kölliker proposed that they be named for Röntgen himself and therefore the term "roentgen rays" was introduced.—K. L. Krabbenhoft, M.D., A History of Roentgen Therapy, *The American Journal of Roentgenology Radium Therapy and Nuclear Medicine*, November, 1956.

SUCCINYLCHOLINE AND INHALATION ANALGESIA FOR MAJOR CARDIAC AND PULMONIC SURGERY

Seymour Schotz, M.D., Shirley S. Bloom, M.D.
and
F. W. Helmsworth, M.D., Philadelphia

• *The anesthetic technique here recommended for intrathoracic surgery begins with premedication by 50 mg. of secobarbital given orally and 0.4 mg. of atropine sulfate hypodermically. For induction, 0.5% solution of thiopental is given by intravenous drip until consciousness is lost. A drip of 0.2% solution of succinylcholine is then started and allowed to run until apnea occurs. Thereafter the anesthesia is maintained by giving a 50-50 mixture of nitrous oxide and oxygen by endotracheal tube. No more thiopental is given. The succinylcholine drip is resumed intermittently whenever it is needed to maintain the apnea; it is discontinued when the chest wall is being closed. The intermittent use of succinylcholine to keep the patient just apneic is called the "in and out of apnea technique" and has several advantages. This method of anesthesia has been used in 253 operations on the chest, including 115 mitral commissurotomies and 22 circumferential mitral sutures. The last-named group accounted for 8 of the 14 instances in which ventricular fibrillation developed. Defibrillation was accomplished in eight cases. The nitrous oxide affords good control of the degree of analgesia, and the succinylcholine helps to provide ideal operating conditions.*

The satisfactory management of anesthesia in patients undergoing surgery within the chest has always presented a knotty problem. In the last decade the growth of cardiac surgery has increased the magnitude of this problem. The accumulating experience of anesthesiologists who have been concerned with the management of patients during cardiac surgery seems to indicate that some form of light anesthesia is most desirable. The avoidance of drugs that tend to produce hypotension or increase cardiac irritability is also of utmost importance. At the same time, the surgeon must be provided with a relatively quiet field in which to perform delicate manipulations.

Technique

For the past three years we have been employing a technique of anesthesia in all patients undergoing pulmonic and cardiac surgery that seems to satisfactorily solve these problems. It is based primarily on the use of nitrous oxide for analgesia and succinylcholine for muscular relaxation. For premedication the patient receives 50 mg. of secobarbital by mouth and 0.4 mg. of atropine sulfate by hypodermic injection one hour before surgery. A polyethylene catheter is placed in an arm vein with use of local anesthesia before the patient is brought to the operating room. During surgery the cardiac rhythm is constantly monitored by the use of an electrocardiograph and an oscilloscope, and pulmonary ventilation is measured by a ventigrator. (The ventigrator is a modification of an integrating meter for the continuous measurement of pulmonary ventilation, originally described by Maloney and co-workers.[1]) Anesthesia is induced with a 0.5% solution of thiopental by intravenous drip until consciousness is lost. A drip of 0.2% solution of succinylcholine is then started and is allowed to run until apnea occurs. During this interval 100% oxygen is administered by mask, with assistance to respiration as it becomes depressed. The pharynx and larynx are then sprayed with 5% solution of hexylcaine (Cyclaine) hydrochloride, and a cuffed endotracheal tube is passed. Administration of thiopental and succinylcholine is discontinued, and the patient is maintained on a 50-50 mixture of nitrous oxide and oxygen using a semiclosed carbon dioxide absorption system.

No further thiopental is given. The smallest amount of thiopental that has been required for induction is 100 mg., and the largest amount was 700 mg., the mean being 450 mg. The effects of this dose of thiopental, judging from the responsiveness of the patient, appear to be worn off in from 20 to 30 minutes and analgesia is then maintained by the 50% nitrous oxide mixture.

From the Department of Anesthesiology, Presbyterian Hospital.

Read before the Section on Anesthesiology at the 105th Annual Meeting of the American Medical Association, Chicago, June 14, 1956.

The succinylcholine drip is restarted when the patient begins to make spontaneous respiratory movements. It is allowed to run until apnea is again produced. This procedure of inducing apnea and then stopping the succinylcholine is repeated throughout the surgery, being finally discontinued when the closure of the chest wall is begun. By the time surgery is completed the patients are breathing spontaneously and moving their extremities. The smallest dose of succinylcholine so used was 100 mg. and the largest 2,100 mg., the mean being 546 mg. The average rate of administration was 5.2 mg. per minute.

Advantages

This intermittent use of succinylcholine, or "in and out of apnea technique," as we have come to call it, offers two advantages. First, the alert anesthetist can detect the first signs of returning respiratory activity and, by giving a small amount of the drug, can again produce apnea, thereby insuring a well-controlled surgical field. Secondly, there is constantly recurring evidence that the patient is metabolizing the drug as it is administered and so there is less likelihood of overdosage and prolonged apnea. In this series there were no cases of prolonged apnea and only one case in which respiration remained depressed for any part of the postoperative period. This latter complication occurred in a patient whose general condition was so precarious at the termination of surgery that the only

evidences of life were the feeble respiratory efforts and the electrocardiographic tracing, no pulse or blood pressure being obtainable.

The 50% nitrous oxide–oxygen mixture that is used for maintenance offers the advantages of a high concentration of oxygen and good analgesia, without being irritating to the respiratory tract and without

TABLE 1.—*Type of Surgery for 253 Cases in Which Succinylcholine and Inhalation Analgesia Was Used*

Type of Surgery	No. of Cases
Pulmonic surgery	37
Exploratory thoracotomy	24
Thoracoplasty	4
Mitral commissurotomy	115
Aortic commissurotomy	14
Mitral and aortic commissurotomy	3
Circumferential mitral suture	22
Pulmonic valvuloplasty	10
Interatrial septal defect repair	3
Pericardial poudrage	8
Exploratory cardiotomy	5
Ligation of patent ductus	4
Resection of coaretation of aorta	1
Insertion of Huffnagel valve	1
Cardiopexy	1
Resection of ventricular aneurysm	1
Total	253

increasing myocardial irritability. That these patients are in the first stage of anesthesia is demonstrated by the fact that they will open and close their eyes and will respond to questions by nodding their heads. At the conclusion of surgery, when administration of nitrous oxide is discontinued, they are awake and cooperative. Questioning the patients in the postoperative period reveals the fact that they have amnesia for the operative period. An occasional patient may have some isolated memory of some part of the operative procedure. However, they invariably report that they felt no pain and do not seem concerned, but regard the experience as they would a dream.

Results

We have used this technique of anesthesia in a series of 253 cases. The types of surgery and the number of cases in each category are indicated in table 1.

TABLE 2.—*Data on Cases in Which Ventricular Fibrillation Occurred*

Type of Surgery	Total No. Cases	No. in Which Ventricular Fibrillation Occurred	No. in Which Defibrillation Was Unsuccessful	No. in Which Fibrillation Was Reversed	Died in Postoperative Period	Satisfactory Postoperative Course
Aortic commissurotomy	14	2	2	...	...	...
Circumferential mitral suture	22	8	2	6	3	3
Mitral commissurotomy	115	3	1	2	...	2
Interatrial septal defect repair	3	1	1	...	...	...
Total	154	14	6	8	3	5

The age of these patients ranged from 4 to 79 years, the majority being between 30 and 50. The physical status of these patients (according to the ASA classification) is either class 3 or 4, the large majority of the cardiac patients being in class 4.

In opening this discussion we remarked that the prevention of hypotension and major cardiac arrythmias were of primary importance to the anesthetist. In this series we have only one case in which there was a period of hypotension that could be directly attributed to anesthesia. It occurred after intubation and responded promptly to a small dose of a vasopressor. Short periods of hypotension (five minutes or less) are commonly seen after intracardiac exploration or instrumentation. Usually the blood pressure will return to the normal level when the cardiac manipulation is stopped. If it does not do so promptly, a small dose of a vasopressor drug given intravenously will produce the desired result. More prolonged hypotensive episodes have always been associated with sudden loss of relatively large amounts of blood or with the occurrence of ventricular fibrillation.

Table 2 shows the types of cases in which ventricular fibrillation occurred, the number in which defibrillation was successful and those in which there was ultimately a good recovery. As can be seen, ventricular fibrillation occurred most frequently in those patients undergoing surgery for mitral insufficiency. These cases represent the most seriously ill patients in the entire group, most of them having reached the point of intractable cardiac failure. In placing the purse

TABLE 3.—*Over-all Mortality in Series*

Type of Surgery	No. of Cases	Deaths	Operative Deaths	Postoperative Deaths
Pulmonic surgery	37	...	...	...
Exploratory thoracotomy	24	1	1	...
Thoracoplasty	4	...	...	...
Mitral commissurotomy	115	7	1	6
Aortic commissurotomy	14	3	2	1
Mitral and aortic commissurotomy	3	...	...	...
Circumferential mitral suture	22	8	2	6
Pulmonic valvulopinsty	10	...	...	...
Interatrial septal defect repair	3	1	1	...
Pericardial poudrage	8	1	...	1
Exploratory cardiotomy	5	...	...	...
Ligation of patent ductus	4	...	...	...
Resection of coaretation of aorta	1	1	...	1
Insertion of Huffnagel valve	1	...	...	...
Cardiopexy	1	1	...	1
Resection of ventricular aneurysm	1	1	...	1
Total	253	24 (9.48% of total)	7 (2.77% of total)	17 (6.71% of total)

string suture, it was necessary to rather markedly dislocate the heart for about 45 seconds. This seemed to be the precipitating factor in producing ventricular fibrillation in this procedure. However, an improvement in the instrument employed has corrected this, and in more recent cases the incidence of ventricular fibrillation has decreased.

In those patients undergoing mitral commissurotomy, there were three cases of ventricular fibrillation. In two of them fibrillation occurred immediately after intracardiac manipulation and was successfully reversed. In the case in which the heart could not be defibrillated, ventricular fibrillation occurred after severe blood loss. The same sequence of events occurred in the two cases listed under aortic commissurotomy and in the interatrial septal defect repair.

The third table shows the over-all mortality in this series. In those patients undergoing exploratory thoracotomy, there was one operative death. This patient had a pulmonary malignancy that had invaded the myocardium. The left ventricle was adherent to the chest wall and was incised at the time the pleura was opened. All the other operative deaths occurred

in patients who went into ventricular fibrillation and have already been discussed. Of the six postoperative deaths in the mitral commissurotomy group, five patients died in cardiac failure at varying times in the postoperative period. One patient sustained a cerebrovascular accident at the time of surgery and did not regain consciousness. There was no period of hypotension during this case, and it may be assumed the cause of this complication was an embolus.

Of the six patients who died postoperatively in the group undergoing circumferential mitral suture, there were two in whom defibrillation had been done successfully during surgery but who remained in poor condition and died within a few hours. One patient died two months postoperatively of bacterial endocarditis, and three died of cardiac failure in from 2 to 21 days.

The deaths after pericardial poudrage and resection of coarctation of the aorta were both sudden catastrophes occurring in the course of what seemed to be a satisfactory convalescence. In neither case was there a postmortem examination. In the case of resection of a ventricular aneurysm, the patient died four hours postoperatively of intractable bleeding from the chest wall, having received 26 pt. of blood and after undergoing a second thoracotomy in an attempt to obtain hemostasis.

Comment

We have presented the outcome of these cases in some detail in an attempt to show that the method of anesthesia we have described does not contribute to the morbidity and mortality in these patients. On the contrary, it seems to offer a method by which seriously ill patients can be successfully anesthetized for pulmonic and cardiac surgery with a minimal disturbance of physiological mechanisms.

The thiopental probably produces an effective basal narcosis for the anesthesia produced by nitrous oxide that follows, in addition to providing a type of induction much less upsetting to the patient than would a strict inhalation technique. We regard it important, however, that the thiopental be given rather slowly in order to minimize the circulatory depression that might attend a rapid injection of the drug.

While we are certain that there are probably other drugs that one might use as the analgesic agent with similar success and while Artusio has certainly proved this to be so with ether, we favor the use of nitrous oxide, partly because (as mentioned) it is free from any undesirable side-effect and also partly because one can repeatedly obtain and maintain the same degree of analgesia in each patient with reasonable assurance. We have already indicated our feeling about the role that succinylcholine plays in providing the ideal operating conditions with minimal side-effect. We have come to regard the ventigrator as an important tool in avoiding either hypoventilation or hyperventilation, either one of which might predispose to troublesome changes in cardiac rhythm.

51 N. 39th St. (4) (Dr. Schotz).

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CLINICAL SYNDROMES PRODUCED BY ISOLATED DYSFUNCTIONS OF THE RENAL TUBULE

Thomas Findley, M.D., Augusta, Ga.

• *Failure of the kidney nephron produces many widespread metabolic disturbances, including hypertension. These conditions may resemble endocrine diseases, but whether they are actually due to hormonal forces or are of direct intracellular origin is still not completely understood. Defects in tubule absorption and resorption may be the nosological element in future explanations of these particular clinical syndromes.*

It is certain that the speakers before the Section on Experimental Medicine will present differing views concerning the hypertension problem, but it seems equally certain that none of them will dare to ignore the kidney. Until the present confusion subsides no one can say whether the chief culprit will be caught lurking in the nervous system, the adrenal cortex, the electrolyte panel, or the kidney, but it is hard to deny that renal epithelium shares the guilt.

The responsible processes are of course not yet understood, and opinion is therefore sharply divided between the "hyperrenalists" on the one hand, who believe that the kidney secretes an excessive amount of pressor and vasopathic material, and the "renoprivalists" on the other hand, who note how difficult it is to produce endocrine hypertension without first reducing kidney mass. Quite possibly both views are right, in that under circumstances not yet defined renal hypertension may be an excitatory phenomenon while under other conditions the kidney may fail to control inherent pressor tendencies.[1] In either event chemical processes within the kidney cell have clearly gone astray.

The term renal failure usually implies oliguria, azotemia, or both, but subtler and more interesting varieties exist. My comments about them will be broader than they are deep, for I can only point out here that failure of the nephron to do particular chemical jobs produces many widespread metabolic disturbances other than hypertension. Some are obviously due to enzymatic dysfunction of genetic origin,

From the Department of Medicine and the Georgia Heart Association Laboratory for Cardiovascular Research, Medical College of Georgia.

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some are acquired disorders, and all are poorly understood. It seems unlikely that much more information of fundamental importance will accrue from the application of the clearance and saturation tests of renal function, which have to date been so useful; future advances will probably come about through the collaboration of careful clinicians and chemists skilled in intracellular processes.

Some of the disturbances to be described resemble endocrine diseases but are really examples of the Seabright-Bantam syndrome, a concept first used by Albright and his colleagues [2] to describe situations created by failure of end-organ response rather than of hormone production. Other abnormalities are clearly due to variations in glandular function, but all too often it is impossible to decide whether alterations in cellular activity are due to intrinsic or hormonal forces. Some examples will be given.

Clinical Syndromes

Defects in Water Resorption.—Diabetes insipidus is usually due to hypovasopressinemia, the result of lesions in the anterior hypothalamus, but in a few cases the condition does not respond to substitution therapy. In some of these cases not due to organic renal disease there appears to be a sex-linked recessive defect that impairs the ability of the distal tubular segments to resorb water.[3] The opposite condition, hypervasopressinemia, either absolute or relative, has not yet been defined, and from the few available reports on cases of edema of unknown origin it is difficult to decide whether retention of sodium or of water is the primary event. In one case [4] the diuretic response to corticotropin resembled that seen in nephrosis and suggested therefore that sodium retention was the initial event; in another, however, no such response occurred.[5]

Defects in Glucose Resorption.—Renal glycosuria, a defect in the enzymatic processes that enable the proximal tubule to resorb glucose, may be on a genetic basis also.[6] Conversely, this mitochondrial mechanism may operate more efficiently in some people than in others, but factors such as diminished glomerular filtration rate and renal blood flow are more reasonable explanations for a high glucose threshold.

The Kidney and Protein Metabolism.—Since there is good reason to believe that mammalian glomerular filtrate contains about as much protein as does cerebrospinal fluid (about 10 to 30 mg. per 100 cc.), the tubules of the human kidney must normally deal with 50 to 60 gm. of protein daily (180 liters of fluid multiplied by 0.3 gm. of protein per liter). Virtually all of this is resorbed, of course, and it is probable that the transport mechanism involves both catabolic and anabolic processes. Proteinuria occurs when glomerular membrane disease increases the filtered load beyond the point of tubular saturation, as in nephrosis.[7] It may or may not be coincidence that the rate of plasma protein regeneration by the human liver approximates that of renal tubular resorption; in any event, the kidney plays an important role in regulating the concentration of circulating protein.

For years Addis [8] suspected that defects in the tubular transport mechanism influence the amount of protein in the blood and urine, and an increased rate of albumin destruction has been demonstrated in idiopathic hypoalbuminemia,[9] a curious nephrosis-like picture with no evidence of renal or hepatic disease. The same inability of the tubule to return protein to the blood stream in an osmotically useful form may also exist in persons with proteinuria, but no evidence of excessive protein destruction has yet been found in nephrosis.[10]

Aminoaciduria.—While many disorders present the kidney with more amino acids than its resorptive mechanism can accommodate, primary or renal aminoaciduria is believed to be an event of great importance in the genesis of the hepatic, brain, and renal lesions of progressive lenticular degeneration (Wilson's disease), the de Toni-Fanconi syndrome, and cystinuria.[11] Paper chromatography has recently uncovered a rather common familial tendency to the excretion of β-aminoisobutyric acid, but the meaning of this genetic abnormality is not yet apparent.[12]

Defects in Tubular Transport of Cations.—Some defects in the resorption of cations and excretion of electrolytes are given below.

Sodium and Potassium: The ability of aldosterone to increase the tubular resorption of sodium and to diminish that of potassium has been brilliantly described by Conn,[13] but hypoaldosteronism has not yet been recognized except as part of the picture of generalized adrenocortical failure. Electrolyte excretion is also controlled by enzyme systems in the tubule cells, especially carbonic anhydrase, which enables the nephron to resorb sodium in exchange for hydrogen. Deficiency of this enzyme has already been suspected in a patient with hypokalemia whose tubules secreted potassium at a high rate but hydrogen in diminished amounts and whose condition was relatively refractory to treatment with acetazolamide (Diamox).[14]

Calcium: Idiopathic hypercalciuria, responsible for a high proportion of kidney stones, apparently represents a genetic inability of the tubule to resorb calcium in proper amounts.[15] It is important to distinguish this primary type of calcium deficit from those that occur as secondary responses to such stimuli as hyperparathyroidism, immobilization of the skeleton, chronic acidosis, high calcium intake, or vitamin D poisoning. Since normal individuals tolerate large amounts of alkali, at least for a short period of time,[16] it may be that the "milk-alkali" syndrome occurs only in the presence of a renal defect that permits excessive resorption of calcium from tubular fluid. Chronic hypercalcemia unrelated to diet has also been described in combination with hyperphosphatemia, osteosclerosis, renal insufficiency, and dwarfism, but the pathogenesis is not understood.[17]

Magnesium: Not enough is known about the tubular transport of magnesium to warrant discussion.

Defects in Tubular Transport of Anions.—Some defects in resorption and secretion of anions are given below.

Chloride: In general the tubular transport of the chloride ion is the same as that of sodium.

Bicarbonate: Whether due to inability of the proximal convolution to resorb bicarbonate [18] or to failure of distal segments to secrete hydrogen or ammonium ions,[19] or to both, hyperchloremic acidosis exists as an isolated genetic defect.[20] It is important because of the destructive effects that prolonged negative balance has upon the skeleton and the kidneys. Serious losses of other cations, especially potassium, may also occur, but the entire process can be checked by adequate alkali therapy.

Phosphate: With the description of hypocalcemic tetany unresponsive to parathyroid hormone, Albright and colleagues [2] first introduced the Seabright-Bantam concept into clinical medicine—a very useful line of thought. It is due to the fact that the renal tubule continues to resorb phosphorus at a high rate despite adequate parathyroid function. The opposing condition, that of chronic phosphate diuresis, results in a type of rickets that is relatively resistant to vitamin D; it is a dominant trait [21] and could represent a deficiency of phosphatases and phosphorylases in the proximal tubule.

de Toni-Fanconi Syndrome.—Finally, the coexistence of multiple defects in almost any combination results in variants of the de Toni-Fanconi syndrome.[22] The classic combination of glycosuria, aminoaciduria, and phosphate diabetes involves a single recessive trait.[21]

Summary

Hypertension is due at least in part to specific defects in renal tubular function and can thus be classified among such other metabolic diseases as nephrogenic diabetes insipidus, renal glycosuria, idiopathic hypoproteinemia, primary aminoaciduria, idiopathic hypercalciuria, renal hypokalemia, chloride acidosis, pseudohypoparathyroidism, vitamin D-resistant rickets, and the de Toni-Fanconi syndrome.

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Anesthesia at High Altitude.—Peculiarities observed . . . during general and regional anesthesia in natives living at high altitude are reported. . . . The polycythemic native, and even more the normocythemic newcomer, require increased pulmonary ventilation at all times at high altitudes to avoid hypoxia (and respiratory acidosis in the native who has a low alkaline reserve). During anesthesia this can be accomplished most easily by manual hyperventilation (intermittent positive pressure breathing) with high concentrations of oxygen. The patient should have fully recovered consciousness and muscle power at the end of an operation before he is disconnected from the anesthetic apparatus. Drugs which exert prolonged depressant effects on breathing and consciousness should be avoided. The relative advantages of certain anesthetic technics are reported.—P. Safar, Anesthesia at High Altitude, *Annals of Surgery,* November, 1956.

DIAGNOSTIC VIRUS LABORATORY FOR CLINICAL SERVICE

John P. Utz, M.D., Robert H. Parrott, M.D.
and
Julius A. Kasel, B.S., Bethesda, Md.

• *A laboratory of the type and size here described was found capable of handling a monthly average of 160 specimens for virus isolation studies and 150 serum samples for serologic studies, and has made it possible to confirm the etiological diagnosis in from 2 to 15 patients per month. The total floor space required for the special incubators, together with the customary laboratory equipment, was less than 90 sq. m. (960 sq. ft.). Two types of cells are propagated routinely, namely monkey kidney and the HeLa carcinoma. In addition, the laboratory is equipped to maintain embryonated hen's eggs for studies of influenza and mumps and certain animals (suckling mice, adult mice, rabbits, and guinea pigs) for other purposes. The personnel include both part-time and full-time workers. This laboratory has been found valuable in improving the care of certain types of patients, in medical education, and in clinical research.*

In the summer of 1953, with the opening of the Clinical Center of the National Institutes of Health, a virus laboratory was established as a diagnostic adjunct to an active infectious disease and pediatric service. Because we believe this to be a unique example of such a clinical-laboratory unit and because of previous inquiries, we would like to report our experiences of the first three years of development and operation of the laboratory for the benefit of others considering establishing such a unit.

Organization of Laboratory

Personnel.—Two physicians with prior experience in virus laboratory research were able to devote part of their time to the supervision of the laboratory. A bacteriologist with a bachelor of science degree and with prior experience in serologic, chicken embryo, and tissue-culture techniques has been able to perform the work described below. Assisting him from the beginning has been a biological aide, helping in the tasks of animal caretaking, glassware washing, preparation of mediums, and processing of specimens for inoculation. As the work load increased, a high school graduate was taken on to assist with the simpler tasks of tissue-culture techniques. Lastly, a master of science in bacteriology was added to supervise the performance of animal and chicken embryo work and thus free the other bacteriologist for tissue-culture and serologic tests alone. Supplementing, and of considerable aid to the laboratory, has been the service, part time, of a clerk–laboratory worker who accepted, prepared, recorded, and stored patient specimens, especially serums.

Space.—Four "modules," each measuring 12 by 20 ft., have been available, at least in part, to this laboratory. The first two of these are shared with others as an animal room and a glass-washing room. A third module is used for tissue culture and the fourth for animal and chicken embryo work.

Equipment.—Customary laboratory furniture, including sinks, animal cages, and racks, has been used. In addition, the following pieces of equipment have been necessary: a freezer, a refrigerator, a centrifuge (International no. PR-1), a bacteriological hood, a large incubator (for roller drums) (Hotpack model no. 8027 [or similar make]), a small incubator (Hotpack model no. 505 [or similar make]) for embryonated hens' eggs, standard microscopes, and roller drums (Wyble Engineering Development Company model no. 1-12 [or similar make]) for rotating tissue-culture tubes.

Methods.—Except for what we will describe below in more detail, the methods used in the laboratory are well known and employed in standardized fashion for diagnostic virus studies.[1] These include (1) animal inoculation: suckling mice for Coxsackie viruses, adult mice for encephalitis and psittacosis viruses, rabbits and suckling mice for herpes simplex virus, and guinea pigs for Rickettsia; (2) embryonated hens' egg inoculation for influenza and mumps; (3) serum studies: complement-fixation tests for the encephalitides, psittacosis viruses, and Rickettsia; hemagglutination-inhibition tests for influenza and mumps; neutralization tests for most viruses.

In addition to these established procedures, we have attempted to adapt tissue-culture techniques to routine virus diagnostic work. Commercially available tissue cultures consisting of trypsinized cells planted directly on glass have been used.

Materials.—Two cell lines are used routinely: monkey kidney and HeLa. HeLa cell cultures are received in growth medium containing human serum. These tubes are emptied of this growth medium and rinsed three times with 1-ml. amounts of Hank's-Simms' mixture (three parts Hank's to one part Simms'). HeLa maintenance medium (70 parts Parker's mixture 199, 20 parts tryptose phosphate broth, and 5 parts chicken serum) is then added, and tubes are stoppered with silicone stoppers prior to inoculation. Monkey-kidney-cell culture tubes are emptied of growth medium. They are not rinsed, and Melnick's medium is added as maintenance nutrient. HeLa tubes are placed in stationary racks. Monkey-kidney cells are kept stationary or rotated at 12 rph in roller drums. All tubes are kept at 36 to 37 C temperature. To all maintenance and rinse solutions are added penicillin and streptomycin in a final concentration of 150 units and 150 mcg. per milliliter respectively.

Routine Clinical Procedures.—From patients suspected of having virus infection, the following specimens, when appropriate, are collected: swabs of eye, ear, nose, throat, anus, vagina, ulcer, or other skin

From the U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases.

lesions; urine; sputum; stool; bone marrow; synovial fluid; spinal fluid; pleural fluid; blood clots; and biopsy and autopsy specimens. Swabs are swirled immediately for a few seconds in vials containing 1.5-ml. amounts of Hank's balanced salt solution, and the swabs are discarded. All specimens are delivered promptly to the laboratory.

Routine Laboratory Procedures.—Solid specimens are ground with mortar and pestle or divided finely with sterile scissors, made up in 10% suspension in isotonic sodium chloride solution, and clarified by centrifuging at 1,500 rpm for 10 minutes, and the supernatant fluid is saved. Before and after centrifugation, 1,250 units of penicillin and 1,250 mcg. of streptomycin is added to stool specimens. Centrifugation of stools is carried out at 4,000 to 4,500 rpm for 60 minutes, and decanted supernatant fluids are kept at 22 C for 60 minutes before inoculation. Urine and sputum specimens are diluted tenfold in isotonic sodium chloride solution before inoculation.

Specimens are inoculated the same day as they are received in the laboratory: 0.1-ml. amounts of all above inoculums are added to 0.9-ml. amounts of nutrient in each of two tubes of the different cell line cultures, and all tubes are then incubated as described above. After 60 minutes' incubation, supernatant fluids from tubes inoculated with stool specimens are discarded and replaced with new maintenance mediums. This and the previous special procedures for stool and urine specimens are done to avoid nonspecific toxic effects on tissue cells that tend to obscure specific virus effects.

Tissues are observed daily thereafter for cytopathogenic effects, and these changes are allowed to progress until maximal degeneration has occurred. At that time, the remaining cells are scraped from the wall of the tube and harvested along with the virus-containing maintenance mediums. One to four or five serial passages in 1:10 dilutions are then made in order to assure that the cytopathogenic changes are due to specific virus effects. Finally, a pool of positive supernatant fluid from a late passage is made up for virus typing.

Cytopathogenic agents are identified by neutralization or other serologic tests. Herpes simplex virus is identified by using antiherpes rabbit serums against suspected supernatant fluids in a tissue-culture neutralization test. Influenza virus is identified with hemagglutination-inhibition tests, using known positive antiserums and supernatant fluids that hemagglutinate in dilution of 1:40 or better.[2] Poliomyelitis and Coxsackie viruses are typed in a neutralization test in tissue culture according to the method of Melnick,[3] as modified in the National Institutes of Health laboratory of Drs. Karl Habel and Alexis Shelokov. ECHO[4] and mumps virus are typed similarly. Adenoviruses (APC) can be identified by means of complement-fixation tests and neutralization tests.[5]

Results

A laboratory has been established and is functioning as a virus diagnostic service to an infectious disease and pediatric clinical service. At its present development this laboratory during the past six months has received for isolation studies a monthly average of 160 specimens, and, in addition, for serologic studies has processed a monthly average of 150 serum samples. Because multiple specimens are received from each patient, percentage isolations from specimens is not a meaningful figure. In meaningful terms, a monthly average of 6 to 8 patients (range 2 to 15) have a diagnosis of virus infection confirmed etiologically by tissue-culture techniques alone.

In terms of specific disease entities, the percentage of diagnoses confirmed by virus isolation can also be computed. During the six-month period from Oct. 1, 1955, to April 1, 1956, a total of 25 patients were admitted to the hospital with severe upper respiratory disease of suspected virus etiology. In 22 of these patients (88%) a virus was isolated. A virus was isolated in 16 (59%) of 27 outpatients with suspected respiratory virus disease. The smaller percentage of confirmatory isolation in outpatients may be a reflection of the smaller number of specimens collected and studied. In 13 hospitalized patients with aseptic (lymphocytic) meningitis, presumably viral in etiology, studied during the summer of 1955, virus was isolated from all but one patient (92%). As an extension of these diagnostic studies, tonsils and adenoids from 19 patients undergoing tonsillectomy and adenoidectomy were cultured, and from 15 patients a virus was isolated. The addition of animal, chicken embryo, and serologic studies further increases the number of such patients who each month have a diagnosis confirmed in the laboratory.

Comment

In the past, diagnostic tests for virus and rickettsial diseases have been done in a few centers only and, for the most part, as a secondary function of laboratory research. In this report we have attempted to describe a laboratory with a primary function of performing diagnostic tests on patients. While this laboratory exists within a research institution, it seems feasible to us, as a result of this experience, that a similar unit could be established and function well in large hospitals or teaching centers. In fact, we envision a day when a virus diagnostic laboratory will be as integral a part of a clinical pathology department as is the bacteriology laboratory now. This optimism is due in part to the use of new tissue-culture techniques, which are supplementing or supplanting older procedures requiring facilities for animal housing and means for incubating embryonated hens' eggs. Furthermore, there are already several commercial sources of material for this tissue-culture work. We share the opinion of others [6] that the application of these techniques may be compared in importance to that of the development of solid mediums for culturing bacteria.

Of what value is such a diagnostic service to a hospital, granted that its operation is more feasible now? To us, the value seems manifold. First, where exact etiological studies are possible, more attention is paid to careful diagnosis of febrile diseases, thus sharpening the clinical judgment of physicians and students. Secondly, at a most practical level, this concern for exact diagnosis results in better care for patients in such areas as, for example, the rejection or proper selection of chemotherapy. Thirdly, on the basis of these etiological studies it becomes more

feasible to separate out from undifferentiated illnesses such clinical respiratory syndromes as pharyngo-conjunctival fever.[7] Lastly, such a diagnostic laboratory opens up possibilities of clinical projects designed to study such problems as the cause of fever in patients with acute leukemia.[8]

Summary

A diagnostic virus laboratory has been established as an adjunct to an infectious disease and pediatric service. Methods previously used in research have been adapted to the diagnosis and care of patients. Such a laboratory, in our opinion, has value in care of patients, medical education, delineation of new clinical syndromes, and conduct of clinical research.

The Hank's-Simms' mixture used in this laboratory is supplied by Microbiological Associates, Inc., Bethesda, Md.

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CLINICAL NOTES

CARDIAC ARREST AT WORK—PENKNIFE THORACTOMY WITH RECOVERY

C. David Brown, M.D., Joel Knudson, M.D.
and
George F. Schroeder, M.D., Chicago

Numerous stories of the case presented below have appeared in the domestic and foreign press. This case has been cited also on two occasions in the medical literature, through personal communications.[1] While all of these descriptions have been basically factual, they sound so unbelievable that a reasonably detailed report for medical publication is indicated. So much local publicity was given that for some time attending physicians were considered negligent by the families of patients who died from cardiac conditions because thoracotomy and cardiac massage was not done.

Report of a Case

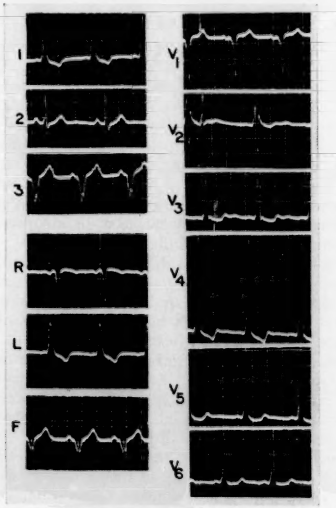
A male, aged 24, apparently in perfect health, as a naval officer had passed a separation examination in June, 1954, and had passed a life insurance examination in October, 1954. On Dec. 17, 1954, at approximately 1 p. m. he was developing x-ray films in the darkroom at Lutheran Deaconess Hospital. Two fellow technicians were also present. He collapsed suddenly and fell to the floor. A brief interval passed before the lights were turned on and the roentgenologist, Frank Hussey, was summoned, and found him pulseless. Hussey ordered epinephrine for intracardiac administration as a desperation measure and requested oxygen. One of us (J. K.), of the medical department, was in the x-ray area and began artificial respiration by the Sylvester method. Another of us (C. D. B.), of the surgical department, happened by and gave 1 cc. of epinephrine into the cardiac region, but the needle was short and the injection was probably given into the pericardial area. On stethoscopic examination no heart sounds were audible, and the pulse was not palpable. The two of us agreed that the victim had a complete circulatory failure and appeared to be dead. After a hurried consultation, it was decided that nothing would be lost by attempting thoracotomy and cardiac massage. With a pocket knife having a 1¾-in. blade, an incision was made between the left fourth and fifth ribs into the thoracic cavity, and the fourth costal sternal junction was severed. No bleeding occurred. The heart was at a standstill, small, and arrested apparently in systole. After approximately one minute of manual systole the heart began to fibrillate. This resuscitation took place on the floor of the darkroom. The third one of us (G. F. S.), of the surgical department, chanced by at this time and assumed responsibility for the administration of the oxygen, which had arrived and was then available per mask. Manual compression was stopped long enough to permit us to carry the patient through the darkroom maze and to place him on a surgical cart. Cardiac compression was maintained and oxygen was given en route to the operating room. After transfer to a surgical table, tracheal intubation was performed and oxygen was administered under pressure. It appears to be a reasonable estimate that four minutes had elapsed before thoracotomy, five minutes before fibrillation began, and eight minutes before tracheal intubation. Fluids were given intravenously, including 60 cc. of 1% procaine, 500 cc. of isotonic sodium chloride solution, 500 cc. of whole blood, and one ampul of glycosides of digitalis, 0.2 mg. Three senior attending men and three residents in surgery maintained cardiac manual compression constantly in regular relays.

No defibrillator was available in our surgery, but one was obtained by ambulance from a neighboring hospital. However, this machine was short-circuited, and so this patient did not receive electrical shock treatment. One and one-half hours later, M. S. Sadove, chief of anesthesia of the University of Illinois Research and Educational Hospitals, was called and was asked to bring his defibrillator. Considering the time lapse and distance to travel, he stated that this was not feasible and he suggested giving potassium chloride into the right atrium to stop all heart action and then calcium chloride to reactivate it. By injection of 3½ cc. of 14% potassium chloride, the heart was brought to a complete standstill and then, since no calcium chloride was immediately available, 5 cc. of 10% calcium gluconate was in-

From the medical and surgical staffs, Lutheran Deaconess Hospital.

jected. No cardiac movement occurred until manual systole was restarted, but then this produced a recurrence of the fibrillation. This procedure was employed a second time with the same results. After two hours and 15 minutes had elapsed, the fibrillation was still present and a third attempt was made using potassium chloride alone. The heart came to a complete standstill, and after an interval of approximately 30 seconds compression was restarted. This time the heart began to beat regularly and has continued in regular rhythm. As adequate circulation was established, the intercostal vessels began to spurt and rapid hemostasis was required. The pericardium was partially closed, the collapsed lung reinflated, and the chest cavity closed with use of a catheter drain with an underwater seal.

The patient was removed to a hospital room and was placed in an oxygen tent with the endotracheal tube still in place. His blood pressure was unobtainable, his apical cardiac rate was 124 per minute, respirations were 36 per minute, and his condition was considered to be poor. However, these signs of shock rapidly disappeared and he responded, to the degree that restraints were required at the end of the first hour. The endotracheal tube was removed after 18 hours, and at the end of 24 hours he was able to talk with his parents. As soon as his



Electrocardiogram taken four months postoperatively indicating Wolff-Parkinson-White pattern.

general condition improved, his behavior became normal and at no time after the first 72 hours has there been any mental aberration or deterioration.

Temperature was elevated the first eight hours to 103.6 F (39.8 C) but remained between 100 and 101 F (37.8 and 38.3 C), except for a febrile episode between the 9th and 11th postoperative days, at which time the range was up to 103 F (39.4 C). During the last five hospital days, the maximum temperature was 99 F (37.2 C). On the first postoperative day the leukocyte count was 37,300 per cubic millimeter; 21,200 on the 3rd; 15,700 on the 4th; 16,200 on the 10th; 17,200 on the 13th; and 14,100 on the 19th. The erythrocyte count ranged from 5,460,000 per cubic millimeter, with hemoglobin level 16 gm. per 100 cc., on the second day to 3,740,000, hemoglobin level 11 gm. per 100 cc., on the fourth day; it was 4,300,000, with hemoglobin level 12.5 gm. per 100 cc., at the time of discharge from the hospital. Urinalysis revealed 4+ albumin with blood nonprotein nitrogen level of 50 mg. per 100 cc. immediately postoperatively, but this decreased progressively, and at the time of discharge albumin was 2+, with occasional granular cast, and the nonprotein nitrogen level 38 mg. Electrocardiograms were taken at intervals starting 10 minutes after the patient was placed in bed. Serial studies, with limited leads at first, show abnormalities throughout. While an electrocardiographic entity cannot be uniformly identified, various cardiologists have advanced the probability of a Wolff-Parkinson-White syndrome (see figure). However, vagovagal reflex arrest has not been definitely excluded.

X-rays were taken at intervals after the fourth day. Films on the 10th day revealed fluid in the left chest, with pneumonitis of the left lung that persisted for several days. On the 19th day, some encapsulation of the fluid appeared in the left chest and the findings of pneumonitis decreased. In films taken at intervals up to 24 months postoperatively, there was absence of part of the fourth rib on the left and otherwise essentially normal findings.

A wide variety of antibiotics were used in large doses by intramuscular, intravenous, and oral routes. Serous sanguinous fluid was aspirated from the left chest cavity on the 10th day. Culture of this fluid revealed pneumococci that were sensitive to erythromycin and bacitracin. These specific antibiotics gave prompt improvement. In spite of a complete absence of asepsis, there was no pleural empyema and only a minimal wound infection.

Supportive measures consisted of oxygen, intermittent for the first seven days; blood transfusions; fluids, intravenously; vitamin K, intravenously; vitamin B complex, intramuscularly; multiple vitamins by mouth; digitalis; increasing diet after first 36 hours; and much diligent nursing care.

This patient was permitted out of bed on the 14th day, and was allowed to be up and about freely and was sent home by automobile on the 22nd day. He returned to his job as an x-ray technician two months after this episode and has worked without loss of time since, 22 months. He dances, skates, plays baseball, drives, and has been a passenger on long plane flights without any apparent untoward reaction. At no time since his discharge from the hospital has there been evidence of any mental or emotional abnormalities and no evidence of loss of or impairment of any vital function.

Comment

This case is considered to be unique in a number of ways. It is one of the very few cases of successful resuscitation of a patient who apparently died of cardiac arrest while at work. Successful conversion from fibrillation to normal rhythm after two and one-quarter hours is a much longer time than the average interval. It is also, as far as we know, the only case in which the thoracic cage has been opened with a penknife while the patient was lying on the floor in an x-ray darkroom. It is also a case in which there appeared to be a happy combination of fortuitous circumstances and favorable coincidences and of a vast amount of unselfish cooperative effort.

The résumé of this case is not given as a guide to the treatment of cardiac arrest, because it is obvious that the management of this case was considerably less than ideal—except in the end-results. However, the factual report of this dramatic episode is presented with the hope of dispelling the atmosphere of fantasy that has surrounded some of the printed references to it.

2716 N. Central Ave. (Dr. Brown).

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IMMEDIATE EFFECT OF CHEWING TOBACCO ON CIRCULATION OF HABITUAL CHEWERS

David L. Simon, M.D., Arnold Iglauer, M.D., John R. Braunstein, M.D.
and
Robert E. Rakel, Cincinnati

Although the annual consumption of chewing tobacco in the United States is 81 million pounds,[1] practically no information is available about its clinical or physiological effect or specifically about its effect on the heart and circulation.[2] To advise patients who are habitual chewers regarding chewing, it is important to know what changes in the pulse rate or rhythm, blood pressure, skin temperature (reflecting peripheral vasoconstriction), ballistocardiographic wave forms, arrhythmias, and circulation may be produced by chewing tobacco. Accordingly, men who chewed tobacco habitually were studied before, during, and after chewing both standard commercial tobacco (1.53% nicotine) and low-nicotine tobacco (0.31 to 0.47% nicotine). In addition, a questionnaire was sent to distinguished cardiologists, internists, and other physicians interested in peripheral vascular diseases to learn their experience with the effects of chewing tobacco on the heart or circulation. None had had personal experience with the effects of chewing tobacco on the cardiovascular system.

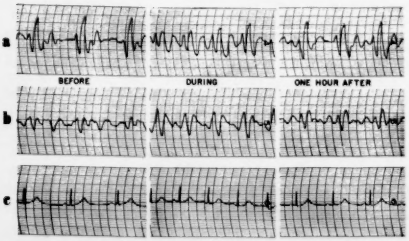

Fig. 1.—Ballistocardiogram longitudinal component (*a*) and horizontal component (*b*) and lead 2 electrocardiograms (*c*). Normal complex deteriorates 15 minutes after patient begins chewing commercial tobacco. The pattern returns to normal one hour later.

Method of Study

The subjects in this study were 24 male volunteers who chewed tobacco habitually; their ages ranged between 34 and 71 years (average age 51 years 1 month). Each subject chewed, on alternate days, a full mouthful of low-nicotine chewing tobacco and a regular commercial brand. Chewing gum was used in several subjects as a placebo. The average amount of tobacco chewed weighed 10 gm.

Observations were made on subjects in the basal postabsorptive state after they had rested at least 45 minutes. The pulse rate was determined from the electrocardiogram, the blood pressures were taken by a standard mercury sphygmomanometer, and the skin temperatures were measured in a constant-temperature room at 78 F (25.6 C) and 40% relative humidity. Continuous temperature readings were recorded from copper constantan wire thermocouples attached to the subject's forehead and the volar surfaces of his fingers and toes, employing a Brown constant-recording potentiometer. Ballistocardiograms were recorded with a high-frequency table-type research instrument.[3] The subjects were supine and unclothed, and they chewed tobacco or gum for 20 minutes.

From the Cardiac Laboratory, Department of Internal Medicine, Cincinnati General Hospital, and Kettering Laboratory, University of Cincinnati.

Results

Ballistocardiograms.—After the chewing of standard commercial tobacco, 23 of 24 subjects had ballistocardiograms showing deterioration of the ballistic wave pattern from the control pattern taken before they had begun chewing (fig. 1). These changes were the greatest on the average 15 minutes after chewing began, and the patterns gradually returned to normal. The changes were generally of the early M pattern. In the same patient whose ballistocardiogram is shown in figure 1, no changes were seen 15 minutes after chewing the placebo gum (fig. 2).

Pulse Rate.—After the subjects chewed commercial tobacco, the pulse rate of one remained constant and the pulse rate of 14 increased markedly. The range of increase was from 1 to 24 beats per minute, with an average increase of 13.4 beats per minute. With low-nicotine tobacco, the pulse rate remained constant in three subjects, decreased in one, and increased in nine (range of increase: 2 to 10, mean: 6.5 beats per minute). With gum, one subject showed a slight rise and one showed a slight fall in pulse rate.

Blood Pressure.—When the blood pressures of 16 subjects were measured, all of these subjects showed a rise in systolic pressure after chewing commercial tobacco and 15 of them showed a rise in diastolic pressure. The range of rise in systolic pressure was 10 to 45 mm. Hg, with a mean rise of 17.9 mm. Hg. The range of rise in diastolic pressure was 5 to 20 mm. Hg, with a mean of 11.8 mm. Hg. In one subject whose blood pressure rose 15/15 mm. Hg after he chewed commercial tobacco, no rise was recorded after chewing gum.

Skin Temperatures.—In most cases, the pattern of temperature changes following the chewing of tobacco was similar to that previously reported in connection with cigarette smoking. Forehead temperatures remained practically constant at 35 C (95 F) with both types of tobacco and with gum. The first toe temperatures taken ranged from 23 to 35 C (73.4 to 95 F), with a mean of 29.7 C (85.5 F). Eight subjects who chewed commercial tobacco showed no significant change in toe temperature, 3 subjects showed small increases (1.3 to 1.7 C), and 11 showed decreases ranging from 1.1 C to 5.3 C. With low-nicotine to-

bacco, nine subjects showed no change, four showed slight increases (1.1 to 2.4 C), and seven showed decreases ranging from 1.2 to 3.6 C. Toe temperatures of three subjects who chewed gum did not change. The first finger temperatures taken ranged from 25.3 to 38.4 C (77.5 to 101.1 F), with a mean of 32.5 C (90.5 F). The finger temperatures of 6 subjects who chewed commercial tobacco remained constant, there were no increases, and 17 subjects showed decreases ranging from 1.3 to 6.7 C. With low-nicotine tobacco, finger temperature increased slightly in one subject, remained constant in 6, and decreased in 13, the range being 1.1 to 6.8 C (fig. 3). Changes were minimal in those subjects who chewed gum.

Comment

The changes observed in the ballistocardiograms, heart rates, blood pressures, and skin temperatures, which indicate peripheral vasoconstriction and stimulation of the central nervous system, are presumably due to nicotine, an alkaloid of tobacco.[4] Evidence accumulated by Dock and associates,[5] Levy and coworkers,[6] Starr and Hildreth,[7] Henderson,[8] Scarborough and associates,[9] and Simon and co-workers[10] seems to indicate that the effect of nicotine from cigarettes is to constrict peripheral vessels in young people. The constriction is said to produce increases in heart rate and blood pressure and decreases in skin temperature, without causing abnormal patterns in the ballistocardiogram, except for occasional instances of idiosyncrasies to tobacco reported by Dock. Evidence is presented here that the effect of nicotine in chewing tobacco on habitual chewers is not only to produce the effects noted in the younger group from smoking but also to produce a very high incidence of deterioration of the ballistocardiogram.

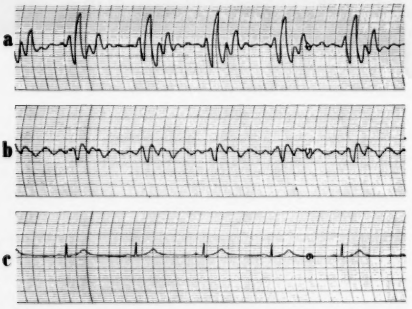

Fig. 2.—Ballistocardiograms (*a* and *b*) and electrocardiogram (*c*) showing no change 15 minutes after patient whose reactions to commercial tobacco are shown in fig. 1 begins chewing gum.

According to Roth [4a] and to the Chemical Laboratory of the American Medical Association,[11] a standard cigarette contains 1 gm. of tobacco, which contains approximately 20 mg. of nicotine, only 3 mg. of which is contained in the main stream of smoke. The average amount of tobacco chewed by our subjects weighed 10 gm. and contained 153 mg. of nicotine. Although we have no estimate of the amount of nicotine absorbed in chewing, larger amounts are available than in smoking. In addition, it is estimated that 66 to 77% of the nicotine in cigarette smoke is absorbed through the buccal mucosa when the smoke is held in the mouth for two seconds.[4a] Therefore, a larger absorption may take place with chewing tobacco, which is held in the mouth for longer periods of time. This may explain the marked changes noted in the ballistocardiograms, blood pressures, and pulse rates.

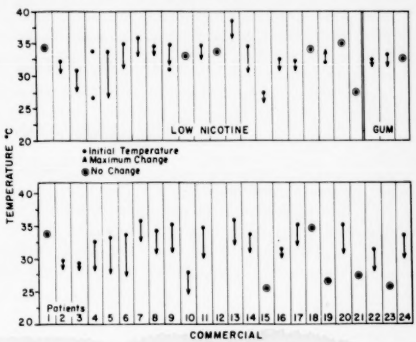

Fig. 3.—Changes in skin temperatures of fingers in subjects who chewed low-nicotine tobacco and gum (*above*) and commercial tobacco (*below*).

Summary

The chewing of tobacco in a group of older men who chewed tobacco habitually produced an increase in pulse rate and blood pressure, a decrease in skin temperature, and a deterioration of the ballistocardiogram. It is believed that these changes are attributable to the nicotine absorbed during the chewing of tobacco.

This work was aided by a grant from the Tobacco Industry Research Committee, New York.

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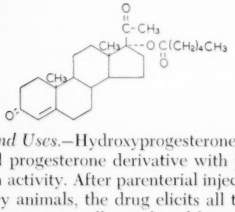
COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

Monographs and supplemental statements on drugs described here and in subsequent editions of New and Nonofficial Remedies are based on the evaluation of available scientific data and reports of investigations. Applicable commercial names for preparations of evaluated drugs are listed at the end of monographs and parenthetically in the text of supplemental statements; additional commercial names of which the Council is informed will be included with subsequently published supplemental statements and annual editions of New and Nonofficial Remedies.

H. D. KAUTZ, M.D., *Secretary.*

Hydroxyprogesterone Caproate. — 17 α-Hydroxyprogesterone hexanoate.—The structural formula of hydroxyprogesterone caproate may be represented as follows:



Actions and Uses.—Hydroxyprogesterone caproate is an esterified progesterone derivative with pronounced progestogen activity. After parenterial injection in man or laboratory animals, the drug elicits all the pharmacological responses usually produced by progesterone. Thus, it increases basal body temperature (thermogenic effect), produces secretory changes in an estrogen-primed endometrium, induces nonspecific histological changes in the vaginal epithelium, and causes withdrawal bleeding from the endometrium after endogenous or exogenous estrogen. It differs from progesterone chiefly in potency and duration of action; the esterified derivative appears to be more potent than an equivalent amount of progesterone, and the duration of its action is unquestionably longer. The latent period between injection of hydroxyprogesterone caproate and the induction of withdrawal bleeding from an estrogen-primed endometrium is usually 10 to 14 days; this is two to three times longer than that period observed after the injection of progesterone. The metabolic fate of the esterified derivative is not well understood; it apparently is not metabolized in the same manner as progesterone, since its administration does not lead to an increased urinary excretion of pregnanediol. Like progesterone, hydroxyprogesterone caproate exerts no androgenic effects.

In general, the indications for the use of hydroxyprogesterone caproate are identical to those for progesterone. The longer duration of action, however, makes it preferable to the parent drug in those conditions in which prolonged progestogen activity is desired. In certain patients with amenorrhea, either primary or secondary, the use of the drug is clearly indicated and established. Care must be exercised, however, in the selection of patients; progestogen therapy should not be undertaken indiscriminately without first attempting to ascertain the reason for cessation of menses. The drug is also effective in producing a secretory endometrium and subsequent menstruation in women undergoing estrogen therapy. The use of progestogens for the treatment of functional uterine bleeding (metropathia hemorrhagica) has been greatly abused in the past. Not only should genital malignancy be excluded in such patients, but diagnostic studies (curettage) should be included before instituting hormonal therapy. In such cases, the use of progestational agents is indicated for diagnosed endometrial hyperplasia. Likewise, the drug should not be used indiscriminately for the treatment of female infertility; however, it may be tried when inadequate corpus luteum function is suspected.

For many years progesterone and its derivatives have been administered for the treatment of threatened and habitual abortion. Recent evidence suggests that a beneficial effect may be obtained if an adequate amount of progestational therapy is maintained throughout pregnancy. For this purpose, hydroxyprogesterone caproate would appear to offer the advantage of a longer duration of action. The drug also has been administered for the treatment of after-pains, dysmenorrhea, premenstrual tension, and such benign breast disorders as cyclomastopathy, mastodynia, adenosis, and chronic cystic mastitis. However, all these indications for progestational therapy are considered by the Council to be unestablished at this time. Hydroxyprogesterone caproate is an effective progestational agent for the use in tests for endogenous estrogen production; however, since a short progestogen effect is desirable, the esterified derivative is not as advantageous as progesterone for this purpose.

The local and systemic toxic effects of hydroxyprogesterone caproate are minimal, and, in therapeutic doses, there are no definite contraindications to its use.

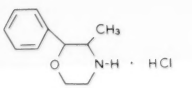
Large doses may rarely produce a slight edema or exacerbate attacks of asthma, epilepsy, and migraine in patients with these conditions. As with all progestational agents, the administration of hydroxyprogesterone caproate during the first half of the ovarian cycle to sexually mature women with regular, normal menses may inhibit the production and/or release of gonadotropic hormones, particularly the leuteinizing hormone. By delaying ovulation, such administration may postpone temporarily the onset of menstruation.

Dosage.—Hydroxyprogesterone caproate is administered as an oil solution by intramuscular injection. The usual single dose for the treatment of ovarian and uterine dysfunction and menstrual disorders ranges from 0.125 to 0.25 gm. For these conditions, the drug should be administered to patients who either produce adequate amounts of endogenous estrogen or who have been primed with exogenous estrogen. The drug also may be administered concomitantly with estrogenic substances. The interval between injections varies with the condition being treated and the individual response of the patient; for most ovarian and menstrual disorders, this interval is usually about 4 weeks, or once during each menstrual cycle. As a rule, the initial injection should be administered about 12 days before the expected or desired menstrual flow. The dosage for the treatment of threatened or habitual abortion is not yet established, although amounts up to 1 gm. per week have been employed.

Applicable commercial name: Delalutin.

E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of hydroxyprogesterone caproate.

Phenmetrazine Hydrochloride.—3-Methyl-2-phenylmorpholine hydrochloride.—The structural formula of phenmetrazine hydrochloride may be represented as follows:



Actions and Uses.—Phenmetrazine hydrochloride is a secondary amine related in pharmacological action to the amphetamine group of compounds. Like amphetamine, it exerts an appetite-depressant effect; it is therefore useful as an anorexigenic agent in the management of simple obesity caused by excessive caloric intake. The mechanism of its effect upon appetite has not been explained. It should be used only as an adjuvant to a weight-reducing program and not as a substitute for conventional measures.

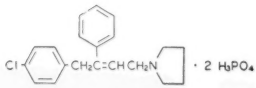
Phenmetrazine hydrochloride produces a stimulating effect on the central nervous system, but in clinical use the side-effects of nervousness, hyperexcitability, euphoria, and insomnia are much less than with the amphetamine compounds and rarely cause difficulty. There have been no reports of significant toxic reactions to the drug, but, on theoretical grounds, it should not be administered to patients with severe hypertension, thyrotoxicosis, or acute coronary disease. It may be used with caution in patients with moderate hypertension and cardiac decompensation. No cases of addiction to phenmetrazine have been reported, but with all drugs causing central nervous system stimulation, including the amphetamines, this possibility must be borne in mind.

Dosage.—Phenmetrazine hydrochloride is administered orally. The usual dose for adults is 25 mg. administered two or three times daily, one hour before meals. Because of variations in eating habits and appetite-peak patterns, it is often advisable to adjust dosage to the requirements of the individual patient. Therapy is continued until the patient reaches the desired weight level, and continued dietary restriction is needed to maintain such a level.

Applicable commercial name: Preludin.

Geigy Pharmaceuticals, Division of Geigy Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of phenmetrazine hydrochloride.

Pyrrobutamine Phosphate.—1-[4-(*p*-chlorophenyl)-3-phenyl-2-butenyl] pyrrolidine diphosphate.—The structural formula of pyrrobutamine phosphate may be represented as follows:



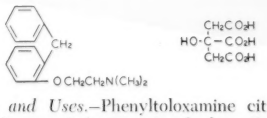
Actions and Uses.—Pyrrobutamine phosphate is an effective antihistamine compound with a low incidence of sedation and other side-effects. (See the general statement on histamine-antagonizing agents in New and Nonofficial Remedies.)

Dosage.—The average oral dose for adults is 15 mg. three or four times daily. Dosage for children is reduced according to body weight.

Applicable commercial name: Pyronil.

Eli Lilly & Company cooperated by furnishing scientific data to aid in the evaluation of pyrrobutamine phosphate.

Phenyltoloxamine Citrate.—N,N-Dimethyl-2-(*α*-phenyl-*o*-tolyloxy)ethylamine dihydrogen citrate.—The structural formula of phenyltoloxamine citrate may be presented as follows:



Actions and Uses.—Phenyltoloxamine citrate is a *β*-dimethylaminoethyl ether of ortho-benzylphenol; as such, it belongs to the group of antihistaminics exhibiting the aminoalkyl ether structure. In addition to an effective antihistaminic action, this compound exerts antifungal and antibacterial activity in vitro; however, its possible clinical usefulness for the latter purposes has not been determined. The incidence of side-effects is low; at recommended doses, soporific effects occur in less than 7% of patients. (See the general statement on histamine-antagonizing agents in New and Nonofficial Remedies.)

Dosage.—The average oral dose for adults is 50 mg. three or four times daily. This may be increased if the desired therapeutic response is not obtained or if side-effects do not become pronounced.

Applicable commercial name: Bristamin Dihydrogen Citrate.

Bristol Laboratories Inc. cooperated by furnishing scientific data to aid in the evaluation of phenyltoloxamine citrate.

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CHAOS OR COMMUNICATION

GUEST EDITORIAL

Irving S. Wright, M.D.

The discovery and study of the substances that play a part in the coagulation of the blood have, as in many other areas in science, progressed in a rather strange and irregular manner. Workers in many laboratories have prepared or described the action of what they have considered to be new factors that contribute to this process, and unfortunately have given them names without knowledge or consideration of the work of others who preceded them. Some factors are now known by from 10 to 14 different names. As reports appear from various laboratories, the use of these terms is confusing to the experienced investigator. A scientific Tower of Babel has thus been erected. The situation appears discouraging, if not chaotic, to the physician who is not a specialist in this field, and even more so to the medical student.

While there is widespread agreement on the meaning of prothrombin, thrombin, fibrinogen, fibrin, and calcium, the meaning of thromboplastin is less clearly understood. There are at least four additional factors that appear to be important in the phenomenon of clotting, and less conclusive evidence suggests that there are probably many more. Each of the four has received a variety of names that are thought to be synonymous, but in some cases may not be. For example, one of these substances has been described and written about as factor VII, proconvertin, serum-prothrombin-conversion accelerator, stabile factor, autoprothrombin I., serozym, kappa factor, prothrombinogen, co-thromboplastin, serum accelerator, prothrombin accelerator, prothrombin-conversion factor, and prothrombin-converting factor.

As a result, communication between English-speaking workers has been definitely retarded; for those who do not read English, this situation is even more serious. In addition, substances of platelet origin and blood-clotting inhibitors are now being studied in detail, and new names are being proposed for these. In order to attempt to bring some organization into the picture and to improve communication in this field, an International Committee for the Standardization of the Nomenclature of Blood Clotting Factors was established at the World Congress on Thrombosis and Embolism held in Basel in 1954. This committee has been engaged in laying a sound foundation on which a system can be evolved for easy cross-identification of factors already well established and for the evaluation of factors about which there is now doubt, or new factors yet to be described.

The committee has taken the position that any terminology adopted as the international one should not be based on any theory of coagulation, since the constant revision of such theories has in the past led to repeated changes in terminology. For the same reason any provisional terminology selected in the future should not imply a supposed function or constitution of the factor to which it refers.

Personal feelings regarding priority and recognition are so strong that no arbitrary ruling regarding the choice of one specific term to the exclusion of all others can be expected to be accepted. The mission of this committee is indeed a difficult one, but it should receive encouragement from all who are interested in an intelligible literature for the future. This development came too late for the committee to have prevented the present state. It is too early to be able to systematize in final form all that will ultimately be known about the factors involved in clotting of the blood.

It seems probable that a common symbol, either a name or a number, will be selected for each factor, and each author will be encouraged to use this together with such a synonym as he may wish to use, the international symbol to be in brackets. The international terms should be short, simple, and readily understood by persons of different nationalities, including those using languages with a variety of alphabetical systems. This will require the cooperation of editors and of interested scientific societies. It is a long-term project. The committee expresses the hope that other agencies will indicate their support of this project and that workers who feel that they may have found a new factor will communicate with the committee so that steps may be taken to prevent further confusion in this field. Subcommittees are now functioning that will provide counsel in regard to critical evaluation of new factors and advice in the selection of appropriate terminology. It is suggested that the adoption of an international term for a new factor proceed in an orderly manner in three stages. The first would be the selection of a name without any international equivalent by the originator. The newly described clotting factor would then be submitted to the subcommittee on criteria, which, depending on the evidence, would or would not assign a symbol to it.

Only after the properties and mode of action of this factor were well established and accepted would a definitive international term be considered by the general committee. (Interested parties may address inquiries to me at the New York Hospital–Cornell Medical College Center, New York City.)

This complex situation might have been avoided or minimized if such a committee had been established 20 years ago. Those who participated in the develop-

From the New York Hospital, New York 21.

ment of both the Standard Nomenclature of Diseases and Operations and the Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Blood Vessels should receive recognition for their important contributions. Nevertheless, on many occasions during the years of labor required to produce these systems, they had occasion to wish that orderly attempts to adopt suitable nomenclature had been evolved as medical knowledge had developed. It is suggested that scientific societies interested in fields in which the nomenclature is rapidly expanding take note of this and take steps to ensure the establishment of an international terminology as the new field develops.

ANDROGEN-ESTROGEN THERAPY FOR ELDERLY PATIENTS

There is considerable evidence that properly controlled low or moderate doses of androgen-estrogen combinations are of value in many of the common disorders that occur in elderly patients. Some of the symptoms that respond to such combined hormone therapy seem to be primarily psychogenic in nature, such as nervousness, irritability, forgetfulness, fatigue, and depression. Some of the symptoms are due to definite physical deficiencies. Postmenopausal osteoporosis frequently responds well to estrogen therapy, which stimulates osteoblastic activity. However, superior results are usually obtained with combined estrogen-androgen treatment. Retention of calcium and phosphorus in the bones is greater when androgens as well as estrogens are used. Androgens are especially effective in promoting storage of protein, which is required for formation of the bony matrix. Negative protein balance in elderly persons is often associated with negative calcium balance, not infrequently manifested by senile osteoporosis involving especially the spine. Protein storage is facilitated and calcium and phosphorus storage promoted by combined estrogen-androgen therapy. Often pains in the ribs and back are definitely relieved. It is, of course, important to devote at the same time adequate attention to nutrition and protein and calcium intake. Therapeutic doses of vitamins C and D are also indicated.

The psychological orientation of elderly persons is frequently much improved, and improved general strength and energy and spirits can result from properly controlled long-term combined hormone therapy. Patients receiving such treatment must be carefully observed to be sure that undesirable androgenic effect is not caused in females and also to ascertain that excessive storage of salt and water or undesirable elevation of the blood pressure does not occur. When edema, hirsutism, hoarseness, or other untoward effects become evident, the dosage of one or both hormones may have to be decreased. Estrogens are the hormones most often implicated in excess fluid retention, while the appearance of acne, excess hair growth, voice changes, or clitoral hypertrophy indicates excess of androgens. When properly balanced combined estrogen-androgen therapy is employed (usually the best proportion is 1:20), untoward effects can as a rule be kept within minimal or negligible limits.

IMPACT AND MEDICAL PRACTICE

The word impact has many meanings. Primarily, we think of it as describing a collision, but it can also be interpreted to mean effectively getting across a point. In medicine the latter seems to be the most workable definition, in connection with health programs or the public relations of medical practice. Doctors are constantly striving to convince the public that the medical profession considers the patient as a person first, and his disease as only a part of the total picture. This is best done by the impact of sincere personal relationships. In his 1956 inaugural address, Dr. Dwight H. Murray, President of the American Medical Association, stressed the restoration of the close personal relationship between patients and their physicians. In his many succeeding talks he has continued this theme, placing the prime responsibility for the return of the humanization of medicine on the family physician. The medical profession must get across the point that, in addition to skill and prescription pad, there is also kindness and understanding in every physician's office.

The measurement of impact has already been undertaken. In studying public health programs emphasizing prevention and control, Drs. Edward Kupka and Paul Q. Peterson [1] have shown that there are two basic forms of impact. One reaches the individual, the other the community, and each is limited in its effectiveness. Using tuberculosis as just one example, they have demonstrated that, while hospital care and clinic services, for this particular disease, have a great impact on the individual, these treatment facilities do not sponsor tuberculosis control measures for the community-at-large to any great extent. In contrast, the blanket technique of health education does not seem to leave a lasting impression on the individual as to why certain elements of tuberculosis control are necessary. While a person may be convinced something is being done, he may not be equally convinced something is being done specifically for him. Thus, when one attempts to make a point (impact), the need is shown for directing equal attention and efforts toward the individual as well as the group, and the means needed to reach the individual differ from the means needed to reach the group.

The basic idea behind the work of Kupka and Peterson can be well applied to the private practice of medicine. To reach the individual, doctors must take a little more time with each patient, sincerely take an interest in his troubles and problems, and, in these days when almost everything has an economic overcast, explain as clearly as they can all the possible or potential costs that might be involved in his particular illness. To reach the community, doctors must more than profess an interest in the place where they live and practice. They must participate in community affairs as constructive and leading citizens. Professional medical advice concerning school problems, civic projects, and even the urging to perform one's duty

1. Kupka, E., and Peterson, P. Q.: Impact: Re-examination of Its Meaning, Journal-Lancet **76**:397-400 (Dec.) 1956.

at the polls (though not necessarily how to cast one's ballot) indicate to a locality that the physician is their family doctor at heart, interested in all phases of their health and welfare.

There are, of course, many gradations between the two previously mentioned extremes of informing people what the private practice of medicine really means. The physician who freely gives his time in the clinic, speaks on topical health matters before a service club, and even, on occasion, holds public office demonstrates, through indirect impact, that he considers the patient and himself as part of the whole, by equally participating in his environment.

Sharing all the aspects of community life, as well as sharing personal problems of the individual that have some physiological or psychological effects on his body, provide the impact that the practice of medicine, and the doctor, are really interested in their patients.

MEDICAL PROFESSIONAL LIABILITY

One of the most frequently discussed and most important subjects of interest to the individual physician and to organized medicine today is medical professional liability. Unfortunately to date a complete study has not been made of this problem. For this reason and in response to a number of resolutions presented to the House of Delegates by state medical societies requesting advice and assistance, an exhaustive survey has been conducted by the Law Department with the cooperation of other councils and committees of the Association.

For approximately two years, facts, figures, and opinions have been systematically collected. This material has been reviewed, studied, and analyzed and is now available for presentation to the profession. In this issue of THE JOURNAL in the column entitled Medicine and the Law (page 364) is an outline of the various phases of the survey and a statement concerning the manner in which the results of the study will be reported in THE JOURNAL. It is anticipated that material on this subject will be published each week in the same section of THE JOURNAL until the entire report has been presented. It is then planned to reproduce and distribute the report, with copies of questionnaires and other necessary attachments, in booklet form.

Every effort has been made to conduct the survey in an objective and judicious manner. It is hoped that the results will contribute to existing knowledge in the field and will provide the basis for workable and effective claims prevention programs. A suggested outline for such programs will be included in a report to be presented to the Board of Trustees and the House of Delegates at the June, 1957, meeting for the consideration of the state and local medical societies.

It is recognized that two approaches to the subject of medical professional liability are available. We can say as little as possible about the subject for fear of stimulating additional claims or we can actively attempt to educate the members of the profession concerning present trends and the pitfalls that they should avoid. The present study and report have been predicated on this second approach. It is believed that only by facing up to all of the facts of the past and the present concerning medical professional liability can the profession intelligently plan ways and means to cope with this problem in the future.

STETHOSCOPE ON CAPITOL HILL

If it is true, as Henry Adams said, that "practical politics consists of ignoring facts," then an unbelievable hoax has been perpetrated by the 359 physicians who have served in the U. S. Congress over the years. As a matter of fact, these doctors—with a background in scientific thought—have helped shape the destiny of our country precisely by legislating most often on a solid foundation of fact, rather than on a cloud of fancy.

The article in the Organization Section on page 361 of this issue of THE JOURNAL explodes the double myth that springs up from time to time in the medical profession: that all politicians are unsavory characters and that doctors should stay out of politics in the interest of themselves and organized medicine. The exact reverse is true. As public enlightenment extends this country's basic concept of representative government, more men of high caliber go to Congress—and doctors often find themselves chosen by their fellow citizens as respected leaders and statesmen in the quest for finer government.

When the 85th Congress convened this month, the names of six physicians sounded on the House of Representatives roll call. They include Nebraska's Arthur L. Miller, Pennsylvania's Ivor D. Fenton and Thomas F. Morgan, West Virginia's Will E. Neal, Puerto Rico's Antonio Fernos-Isern, and Minnesota's Walter H. Judd (who was virtually alone in sounding the alarm against Japanese military expansion before World War II). Their combined service as national legislators totals 74 years.

In our nation's 181-year history, not a single Congress has been without at least several doctors in the role of legislators. And the physicians were right there at the start; five of them signed the Declaration of Independence. Through the years, scores of doctors who voted in either the Senate or the House of Representatives have also served as state or territorial governors, judges, sheriffs, state legislators, and mayors.

All this experience points up the fact that there is nothing improper or new in physicians taking an active part in our national government. Indeed, when the electorate calls, it is a sacred duty on a par with medicine's highest precepts toward helping in the good health of our fellow man. As is stated in the American Medical Association's Principles of Medical Ethics, approved by members in usual democratic process: "They should bear their part in enforcing the laws of the community and in sustaining the institutions that advance the interests of humanity."

ORGANIZATION SECTION

DOCTORS IN GOVERNMENT

The following special report was released from the Washington Office of the American Medical Association and is reproduced in THE JOURNAL *for the interest of those who usually do not see reports from the Washington Office. To quote in part from the Director's preface:*

"It is the story of the 359 physicians who, over the years, have helped to shape the destiny of the country as members of the U. S. House of Representatives and Senate.

"The story is interesting and in some ways revealing. For example, at least 13 also were state or territorial governors, and three states selected men from this group as their first governors. If the REPORT does nothing else it will document the point we have been making for years: There is nothing new, unusual or improper in doctors taking an active part in the national government; they have been doing so from the very beginning of the Republic.

"We are not offering this as a complete or definitive historical work on doctors in government. It deals only with those who served in the House or Senate. Obviously we can't touch on all of them, but we have said something about more than 50 whose careers seemed to us to be particularly outstanding or unusual."—ED.

Doctors Were in on the Ground Floor: Five Signed Declaration.—In 1776 JOSIAH BARTLETT was 47 years of age, described by his biographer as "a tall man with a fine figure . . . who . . . wore his auburn hair in a queue." He was considerably more than that. He was a distinguished New Hampshire physician and an able and ardent patriot. He already had suffered for his interest in politics; he had been ousted from his post as justice of the peace by the Royal Governor of New Hampshire, and had seen his home burned to the ground.

By 1776 Dr. Bartlett clearly had made his choice. So it was natural that as a New Hampshire delegate to the Continental Congress he signed the Declaration of Independence. Perhaps it was only an accident, but he was the second person to sign the engrossed document at the formal ceremony on August 2 of that year.

Dr. Bartlett was not the only physician to sign the Declaration. There were four others: DRS. LYMAN HALL, BENJAMIN RUSH, MATTHEW THORNTON and OLIVER WOLCOTT. All except Dr. Wolcott were in active practice at the time; while trained in medicine, he had given it up for law.

With all the others who signed the document—the lawyers, the statesmen, the soldiers, the businessmen—these five doctors were to achieve a degree of immortality. They are also symbolic of the strong interest the medical profession has taken in national legislation over the years.

Doctors in Congress Through the Years: By States, by Parties.—Dr. Bartlett had been one of four physician members of the Second Continental Congress in 1775. The next year the Colonies sent eight doctors to the deliberations. In the critical years of 1783-84, eleven doctors were in the young Congresses that struggled to keep the states united. It is a tribute to the versatility of the profession that in the 181 years since 1775 doctors have sat in every Congress.

Research by this office carries down through nearly two centuries, Congress by Congress, the story of the medical profession's contribution to the development of the American legislature. Here are some statistics on the doctors' participation:

Total Representation: Six physicians now are members of the House of Representatives of the 85th Congress that convenes in January. Counting them, a total of 359 physicians have served in American Congresses since 1775, including 35 Senators. Of the 359, eleven practiced another profession—generally law—as well as medicine, 33 were not active in practice when elected, and 18 had graduated in medicine but never practiced.

By Parties: A total of 165 physicians were Democrats. Other party representation: Republicans 67, Whigs 30, Federalists 17, Jacksonian Democrats 6, American party 5, National Republicans 2, Independents 2, and one each from six other minor parties. There is no record of party affiliation for 32 doctors in Congress, and party labels were not attached to the 27 who sat in the Continental Congress between 1775 and 1788.

By States: The large states that were members of the original 13 Colonies naturally have supplied the most doctors to Congress. Leading the list is Pennsylvania with 52. Next are New York with 48 and New Jersey, 30. Ohio, although coming into the Union later, has sent 26 doctors to Congress. Other totals: Georgia 17, Kentucky 12, Maryland 16, Massachusetts 13, Missouri 10, New Hampshire 14, Virginia 18, North Carolina 11. Connecticut has elected six to Congress, Delaware seven, Illinois five, Indiana seven, Louisiana five, Michigan five, South Carolina five, Tennessee eight. The following have elected from one to four physicians as Representatives or Senators: Alabama, Arkansas, California, North Dakota, Florida, Idaho, Iowa, Maine, Minnesota, Montana, Nebraska, New Mexico, Oregon, Rhode Island, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin and Wyoming. Puerto Rico's present Resident Commissioner also is a physician, Dr. A. Fernos-Isern. He is a non-voting member of the House.

Sketches of a Few Famous American Physician-Legislators.—During the troubled years from 1810 to 1849—the War of 1812, the struggle for expansion, the Mexican War, the early political skirmishes over slavery—there were at least eight and usually 12 to 18

doctors in Congress. In the following few sessions of Congress, the years leading up to the Civil War, the profession also was well represented, having from seven to 15 of its members in the House or Senate. During the Civil War, although a high percentage of the doctors were with the armies, between five and seven usually were seated in Washington.

These statistics may be important, but they show nothing at all about what these men were like as men, or what impelled them into the turmoil of national politics. In subsequent paragraphs some of them will be described in other connections—as state governors, as military line officers, as physician-legislators who also made unusual contributions. Below are brief sketches of a few not otherwise described in this report who were outstanding:

Matthew Thornton, a contemporary of Dr. Bartlett and the third signer of the Declaration of Independence, was a colonel in the New Hampshire troops almost 30 years before the Revolutionary War. Massive physically as well as mentally, he is said to have had "black and penetrating eyes and an invincibly grave expression." After one session of the Continental Congress, he was appointed to his state's supreme court and thereafter did not practice medicine. One example of his mental capacity: when past 80 years of age he wrote a metaphysical treatise.

Lyman Hall, another signer of the Declaration, was born in Connecticut, graduated from Yale, then migrated to St. John's Parish on the Georgia coast, where he gathered around him a colony of intellectuals and independents. When he arrived at the Continental Congress in 1775, John Adams described him as "intelligent and spirited . . . made a powerful addition to our phalanx." Like Dr. Bartlett and most of the others, he suffered for his views. His home was burned by the British in 1778. Later, as governor of Georgia, he helped to found the University of Georgia. Throughout his career he practiced medicine while also prospering as a rice planter.

Benjamin Rush of Pennsylvania, another practicing physician who signed the Declaration, was easily the most famous American physician and medical teacher of his generation. Dr. Rush was a rugged character, brash and bold in debate and in conduct. His correspondence was so indiscrete—he feuded violently with Washington, among others—that his family kept his private papers secret until recent years. He was a confidant of all the important men of his age in political life. It was to him that Jefferson wrote the famous line: "I have sworn upon the altar of God eternal hostility against every form of tyranny over the mind of man."

William Shippen of Pennsylvania, was a member of the Continental Congress and a dedicated physician all his life, one of the founders of the College of Philadelphia (later University of Pennsylvania) and of the College of New Jersey (later Princeton).

Samuel Holten of Massachusetts, a friend of the Revolution from the beginning, held many state posts, and was a member of Provincial Congress, of the Committee of Safety and at one time president pro tempore of Continental Congress; later a judge.

David Ramsey of South Carolina, where he moved from Philadelphia, was an Army surgeon during the Revolution. Captured at the fall of Charleston, he was imprisoned by British for 11 months. Later, a member of Continental Congress and at one time its President pro tempore, he instituted the first election contest ever filed before Congress.

John Condit of New Jersey, was twice appointed and twice elected to the U. S. Senate and several times elected to House. A founder and trustee of Orange Academy, he was an Army surgeon during the Revolution.

Samuel L. Mitchell of New York, served as Representative or Senator from 1800 to 1813. He was medical editor and professor of natural history and botany and materia medica in the New York College of Physicians and Surgeons.

Westel Willoughby Jr., of New York, was state judge, member of state Assembly and president of Western New York College of Physicians and Surgeons. He was an Army surgeon (1812) before election to U. S. House. He founded the town of Willoughby, Ohio, and Willoughby College (now part of Syracuse University).

Royal S. Copeland of New York, perhaps best known of the modern physician-senators, entered political life as mayor of Ann Arbor, Mich., 1901-1903, and on moving to New York City, served as public health commissioner for five years. He was elected to the Senate in 1922 and served until his death in 1938.

13 Physician-Congressmen Also Were Governors.—Among the 359 doctors who have reached Congress, there are scores who, the records show, thrived on political combat. All their lives they were active in state and local politics and government, as well as national. They were sheriffs, judges, state legislators, state and national committeemen. Records we have studied are evidence that at least 13 of these men—doctors elected to Washington—also became state or territorial governors at one time or another.

One of the most colorful must have been Dr. James W. Throckmorton of Texas, who served in the House of Representatives after the Civil War. He was elected governor of Texas without much trouble, but was thrown out of office on orders of General Sheridan.

Three states—Alabama, Delaware and Ohio—had doctors as their first governors. William W. Bibb was Alabama's first governor, before coming to Congress, where he served both in Senate and House. Likewise, Edward Tiffin was elected first governor of Ohio in 1803, following which he came to Washington as a U. S. Senator. Joshua Clayton, who had one term in the U. S. Senate at the end of the eighteenth century, was Delaware's first governor.

At least two physicians who served in Congress also have been territorial governors. Late in his career, William A. Newell was territorial governor of Washington a job that could not have been a novelty to him as he had served as New Jersey's chief executive between two terms in the U. S. Senate in the mid-nineteenth century. Dr. Newell rounded off his career with an ap-

pointment as U. S. Indian Inspector, starting in 1884. During the Civil War WILLIAM JAYNE was Dakota Territory governor after sitting two years in the U. S. House as a non-voting delegate.

Other physician-governors who spent some time in the U. S. House or Senate: JOHN OSBORN, Wyoming governor 1893-95; WILLIAM HARRISON BISSEL, Illinois, mid-nineteenth century; ALEXANDER M. DOCKERY, Missouri's governor at end of nineteenth century; WILLIAM EUSTIS, who served as U. S. Minister to the Netherlands and Governor of Massachusetts after two terms in the House of Representatives; JOSEPH KENT, Maryland's governor between terms in U. S. House and Senate; and Drs. Hall of Georgia and Wolcott of Connecticut, mentioned earlier as signers of the Declaration of Independence.

Scores of Physician-Congressmen Also Led Troops in Battle.—When the country was young and bursting at its seams, doctors like others moved from one profession or business to another rather freely—medicine to law to agriculture then perhaps back to medicine. But among doctors in national politics, the most popular transition was from medicine to military duty as line officers, then back again to medicine. This tendency was pronounced during the Revolutionary War, continued through the War of 1812, and was not unusual in the Civil War, even though by that time there was a national awareness of the great value of military surgeons.

HENRY M. SHAW of North Carolina, served two terms in the U. S. House of Representatives before the Civil War. But when the fighting started he showed up as a line colonel in the Confederate Army and was killed in action near New Bern, N. C.

Similar to his career was that of a contemporary, GRAHAM FITCH of Indiana, who raised a regiment of volunteers for the North and led the men as colonel until wounds forced his retirement. A younger doctor in Virginia, ROBERT E. WITHERS, followed the same course; a major of infantry, then colonel, finally discharged "in consequence of numerous disabling wounds." After the war he served in the Senate, founded the Lynchburg, Va., *News*, was named consul at Hong Kong.

A generation earlier SOLON BORLAND of Arkansas had done the same thing—practiced medicine until the fighting started in Mexican and Civil Wars, then led troops in battle. His Senate service came between the wars. Similarly JOHN BRATTON of South Carolina preferred fighting to doctoring; like Dr. Borland he had the rank of line brigadier general in the Confederate Army. He was a U. S. Senator after the reconstruction period.

In view of these cases, it is not unusual that two physicians who served in Congress also were selected as Secretary of War. One was HENRY DEARBORN of Massachusetts, line officer in the Revolutionary War, secretary of war for eight years under Washington, member of Congress, then senior major general in command of troops in the War of 1812. An earlier Secretary of War for Washington was JAMES MCHENRY of Maryland, whose Revolutionary War record shows him as surgeon, secretary to Washington, member of Lafayette's staff. He had sat in the Continental Congress.

They Were Lawyers, Botanists, Astronomers, Diplomats, Preachers.—In addition to sitting in the U. S. Congress, doctors had the enthusiasm and capacity for many other activities, some unusual. They are not easy to catalog. Following are a few words about more of them. Unless otherwise indicated, their Congressional service was in the House of Representatives and during the years shown in parentheses:

JOHN ARCHER of Maryland (1801-09) received the first medical degree issued on the American continent . . . Several combined preaching or theology with medicine— JOHN BULL of Missouri (1833-35), OLIVER CROMWELL COMSTOCK of New York (1813-19), LUTHER JEWETT of Vermont (1815-17), HUGH WILLIAMSON of North Carolina (1789-93), and MANASSEH CUTLER of Massachusetts (1801-05). Dr. Cutler also had the time to be a lawyer, botanist and astronomer . . . JOHN S. HARRISON of Ohio (1853-59) had as good a claim on the White House as a man could get without being elected to it: he was the son of one President and the father of another. The first President Harrison, incidentally, studied medicine but did not practice . . . Two doctors who served in the Congress were later directors of the U. S. mint. SAMUEL MOORE of Pennsylvania (1817-23) and DANIEL STURGEON of Pennsylvania (Senate 1840-51), and one was U. S. Treasurer, THOMAS T. TUCKER of South Carolina (1787-88) . . . ALEXANDER CAMPBELL (Senate 1809-13) was vice president of the first Ohio anti-slavery society . . . THOMAS DUNN ENGLISH of New Jersey (1891-95), trained as physician and lawyer, neglected both for writing . . . SAMUEL FOWLER of New Jersey (1833-37) is recognized as the discoverer of two minerals, fowlerite and franklinite . . . JOHN E. HUTTON of Missouri (1885-89) practiced law and medicine at the same time . . . After serving in the House, GEORGE B. LORING of Massachusetts (1877-81) was made U. S. Commissioner of Agriculture, then minister to Portugal . . . WILLIAM S. HAYMOND (1875-77) organized the Central Medical College of Indianapolis, after Civil War service . . . NORTON S. TOWNSEND of Ohio (1851-53) became prominent in scientific agriculture . . . WILLIAM DARLINGTON of Pennsylvania (1815-23) was internationally recognized as a botanist . . . ROBERT B. VANCE of North Carolina served one term (1823-25), was defeated three consecutive times when he tried again, the last time with a degree of finality: his successful opponent killed him in a duel.

Physician Members of 85th Congress, Which Convenes in January.—WALTER H. JUDD of Minnesota, member of House since 1942. Served in field artillery in World War I, medical missionary in China 1925-31 and 1934-38; just prior to World War II staged virtually one-man campaign to arouse people of U. S. against Japanese military expansion. ARTHUR L. MILLER of Nebraska, member of House since 1942.

Army reserve surgeon in World War I, Mayor of Kimball, Neb., member Nebraska legislature, state health director. IVOR D. FENTON of Pennsylvania, member of the House since 1939. Army surgeon for 20 months in World War I, 11 months overseas. THOMAS F. MORGAN of Pennsylvania, member of House since 1944. Maintains practice at Fredericktown, Pa. WILL E. NEAL of West Virginia, member of House 1952-54, elected again for 1957-58. General practice at Huntington, W. Va., since 1906, with exception three years as mayor. Served in state legislature and in various health posts. ANTONIO FERNOS-ISERN, Puerto Rico's Resident Commissioner in Washington since 1946. Cardiologist, professor of public health in School of Tropical Medicine of Puerto Rico, commissioner of health, and acting Governor of the island several times prior to election to House.

MEETINGS OF DOCTORS AND LAWYERS

Doctors and lawyers in Atlanta, Ga., Denver, and Philadelphia will meet in March at the invitation of the American Medical Association to discuss mutual problems of the two professions. The meetings have been scheduled as a follow-up to three similar sessions held in other cities last fall. "Medicine and the law must work together so frequently that we feel open discussions of mutual problems are of the utmost importance," said C. Joseph Stetler, Director of the Law Department of the A. M. A., in announcing the series. Subjects to be included in the discussions will be trauma and disease, medical expert testimony, and the medical witness. In addition, a mock trial will demonstrate the introduction in court of chemical tests for intoxication.

The symposiums will be held at the Atlanta-Biltmore Hotel in Atlanta, Ga. March 15-16; the Cosmopolitan Hotel in Denver, March 22-23; and the Benjamin Franklin Hotel in Philadelphia, March 29-30. In each city, plans are being made for audiences of between 300 and 350, divided as evenly as possible between physicians and attorneys. The registration fee for each symposium will be $5, to cover the cost of a luncheon session and a copy of any proceedings that are published. Advance registrations should be sent to the Law Department, American Medical Association, 535 N. Dearborn St., Chicago 10. Mr. Stetler pointed out that interest in the new series of medicolegal meetings has been so great that early registrations are advisable.

INDEX OF ARTICLES IN TODAY'S HEALTH

Physicians and their wives who are called on to give health talks before nonmedical groups will appreciate the new Cumulative Index to *Today's Health* magazine, published by the American Medical Association. From January, 1950, through December, 1955, more than 1,475 articles appeared in *Today's Health*. This valuable reference guide may be purchased from the Order Department for 50 cents a copy.

NEW MEMBER OF LAW DEPARTMENT STAFF

Warren E. Whyte has joined the staff of the A. M. A. Law Department as executive secretary of the Committee on Legislation, succeeding R. G. Van Buskirk, who has entered the practice of law in Baton Rouge, La. Mr. Whyte served for two years as trial attorney for the Food and Drug Administration in Washington, D. C.

MEDICINE AND THE LAW

STUDY OF MEDICAL PROFESSIONAL LIABILITY

The following is a chronological résumé of the actions taken during the past two years by the Law Department with respect to the subject of medical professional liability. It will outline the various phases of the study conducted and the manner in which the results of the study will be reported in THE JOURNAL.

At its meeting in December, 1954, the Board of Trustees requested the Law Department to consider the actions taken up to that time by the Association with respect to professional liability and to plan and initiate any necessary additional studies. This action by the Board was taken in response to a number of resolutions presented to the House of Delegates by the state medical societies requesting advice and assistance in this field. After consultation with the staff of the Council on Medical Service and the Chairman of the Committee on Professional Liability of the Committee of Medicolegal Problems, it was agreed that further exploration was necessary and desirable.

Since the initiation of its study, the Law Department has submitted three progress reports to the Board of Trustees: one in May, 1955, one in November, 1955, and the most recent in May, 1956. A final report on the initial phases of the study will be submitted to the Board and the House of Delegates at the June, 1957, meeting in New York City. Prior to that time and beginning with this issue of THE JOURNAL, a series of articles and analyses of statistical data will be published. This material will appear each week for the next several months in this column.

Scope of the Study

In planning the study it was decided that the following projects should be undertaken:

1. An analysis of state insurance laws and regulations. A questionnaire was prepared jointly with the Council on Medical Service and sent to each state insurance commissioner. The desired information has now been received from all states.

2. A review of state statutes of limitations. A detailed study of the statutes of limitation of each state relating to medical professional liability suits has been completed.

3. An analysis of reported cases. A review has been completed of every medical professional liability case reported from 1935 through 1955. Information that has been culled from these cases has been coded and placed on punch cards. The report on these cases, numbering about 750, will show the areas of medical practice in which professional liability cases occur most frequently, the circumstances usually surrounding such claims, their disposition, and the amount of the judgments.

4. An analysis of professional liability claims involving physicians in government service.

5. A survey and analysis of pertinent state legislation. From this phase of the study it is possible that some recommendation can be formulated for model legislation covering the field of professional liability.

6. A survey of state medical societies. A three-part questionnaire concerning the availability of professional liability insurance, the most prevalent problems in the field, and the status of claims prevention programs was sent to the 48 state medical societies and the medical societies of the District of Columbia, Hawaii, and Alaska. Thus far, replies have been received from all but five.

Information developed from this questionnaire will shed light on the opinion of the medical societies as to the most common causes of professional liability claims and suits, the effect a professional liability claim has on the reputation and practice of a physician, the availability of professional liability insurance and the names of carriers writing this type of coverage in each state, the average amount of professional liability insurance physicians carry, and the methods used by the state medical societies to cope with this problem through claims prevention and claims review programs.

7. A survey of national medical societies. A questionnaire inquiring as to group insurance programs or other arrangements for providing professional liability insurance to members was sent to 13 national medical societies. The desired information has been received from all of these organizations.

8. A survey of physicians. Physicians representing a random sampling of 5% of the American Medical Association membership have received a questionnaire seeking information as to their opinion on various aspects of medical professional liability and also inquiring whether a professional liability claim has ever been brought against them. The information thus obtained has been coded and key-punched on IBM cards. Various statistical analyses will be made of the opinion of physicians as to the value of professional liability claims prevention and claims review programs, the subjects that should be covered in such programs, and the availability and average amount of professional liability insurance carried by physicians.

A second questionnaire was sent to those physicians who indicated in response to the first questionnaire that a malpractice claim or suit has been brought against them. Detailed information was requested in this second questionnaire concerning each claim. As a result of the information received, various analyses will be made showing the status of claimants as to age, sex, and occupation; negligent acts alleged; the relation of the physicians' type of practice to the alleged negligent acts; the places where the incidents occur; and the disposition of all claims and suits.

9. The preparation and publication of special articles. Fifteen subjects were selected for articles to be included in a special series on the subject of medical professional liability. The subjects to be covered are The History of Professional Liability Claims in the United States; Put It in Writing, Doctor; Medical-Legal Hazards of Anesthesia; Physicians Expressing Opinions as to Former Treatment; The *Res Ipsa Loquitur* Case; The Rule of *Respondeat Superior*; Hazardous Therapy; New Concepts in Professional Liability Suits; Professional Liability Claims Prevention; Professional Liability Insurance Limits; Professional Liability Claims in England; The Law of Professional Liability; The Medical Professional Liability Suit—Preparation and Trial; Timely Use of Consultants; and Safety Engineering in Medical Practice.

These categories will form the basis for the report to be presented to the Board of Trustees and the House of Delegates in June, 1957. A definite schedule as to the order of publication of this material in THE JOURNAL cannot be stated at this time. The first items to appear, however, will be the first four of the special articles listed above. The first article mentioned will appear next week.

The Law Department intends to continue its study of this subject after June, 1957, in other areas. An opinion survey among attorneys and members of the judiciary experienced in the handling of medical professional liability suits will be included. There will also be a study of insurance experience and rates and a survey of comparable fields of negligence actions.

Conclusions

We believe that the results of this study will indicate to the profession generally an accurate picture of the current status of the number and causes of professional liability claims and suits and the availability and cost of liability insurance. More importantly, we believe we have determined the causes for the present situation and for the aggravation of the problem in certain areas. Armed with these facts, we should be in a position to plan a long-range educational program for presentation to both the legal and medical professions.

MEDICAL NEWS

CALIFORNIA

Assembly on Metabolic Disease.—The fifth annual graduate assembly devoted to "The Dynamics of Endocrine and Metabolic Disease" will be held Feb. 11-13 at Highland–Alameda County Hospital, Oakland, under the auspices of the committee for postgraduate medical education of the Alameda–Contra Costa Medical Association and the Institute for Metabolic Research of the Highland–Alameda County Hospital. Enrollment will be limited to 100 participants by subscription. Inquiries should be addressed to Dr. Laurance W. Kinsell, Highland–Alameda County Hospital, Oakland.

Meeting on Obstetrics and Gynecology.—The Obstetrical and Gynecological Assembly of Southern California will convene for its 12th annual meeting Feb. 11-15, at the Ambassador Hotel, Los Angeles. The faculty will include Drs. Willis E. Brown, University of Arkansas School of Medicine, Little Rock; George H. Gardner, Northwestern University Medical School, Chicago; Ernest W. Page, University of California Medical School, Berkeley–San Francisco; Franklin L. Payne, University of Pennsylvania School of Medicine, Philadelphia; E. Stewart Taylor, University of Colorado School of Medicine, Denver; and Curt Stern, Ph.D., University of California Medical School, Berkeley. Communications should be addressed to P. O. Box 57118, Flint Station, Los Angeles 57.

CONNECTICUT

Course on Economics of Medical Practice.—The Connecticut State Medical Society, in cooperation with the department of public health, Yale University School of Medicine, New Haven, will present "Administrative Medicine" at the Brady Auditorium, 310 Cedar St., Feb. 7, 4 p. m. Hospital administration will be discussed by Dr. T. Stewart Hamilton, director, Hartford Hospital, and insurance administration by Dr. Robert A. Goodell, medical director, Phoenix Mutual Life Insurance Company, both of Hartford.

ILLINOIS

Chicago

Society News.—The Chicago Society of Physical Medicine and Rehabilitation will meet Feb. 13, 8 p. m., at the Stritch School of Medicine, Loyola University, 706 S. Wolcott Ave. Dr. David I. Abramson, chairman, department of physical medicine and rehabilitation, University of Illinois College of Medicine, will discuss "Vascular Disorders of the Lower Extremities."

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

LOUISIANA

Regional Meeting on Pathology.—A joint meeting of the College of American Pathologists, south central region, with the Louisiana Pathology Society and the Louisiana division of the American Cancer Society will be held in New Orleans, Feb. 14-17, at the Louisiana State University School of Medicine and the Roosevelt Hotel. An all-day seminar on Friday on ophthalmic pathology will have as moderator Dr. Andrew S. Ranier, Lake Charles and as guest conductors Drs. Lorenz E. Zimmerman, Washington, D. C., and George M. Haik, New Orleans. The Louisiana Pathology Society will be host at a social hour, 6:30-8 p. m. A workshop in immunohematology and blood banking has been scheduled for Sunday morning at the Louisiana State University School of Medicine.

NEW YORK

State Medical Society Sesquicentennial.—The Medical Society of the state of New York will observe the 150th anniversary of its founding at Albany in February, 1807, with a statewide program of celebration by the 24,323-member association and its 61 component county medical societies. The Sesquicentennial Convention, Feb. 18-21, will be held at the Hotel Statler in New York City. An exposition of the history of medicine in the Empire State will depict medical progress "from Colonial Times to the Atomic Age." Through its president, Dr. James Greenough, Oneonta, the society extends a cordial invitation to all residents of New York and neighboring states.

The scientific program will consist of general sessions, symposiums and panel discussions, closed-circuit color television, scientific motion pictures, and scientific and technical exhibits. On the opening day an invitational luncheon will be held, at which representatives of the three principal faiths will discuss the interrelation of religion and medicine. The American Board of Legal Medicine announces a luncheon at which a panel of doctors and lawyers will review the medical and legal aspects of "The Relation of Trauma to Disease." Requests for reservations, accompanied by a check or money order for $5 a person, should be sent to the Secretary, American Board of Legal Medicine, Inc., 1501 Broadway, New York 36. On Wednesday, a public forum on medical care (either at Town Hall or at Hunter College) will be addressed by spokesmen of government, labor, management, and the medical profession. Tickets for the banquet Tuesday ($15 each) can be obtained by forwarding a check or money order, payable to the society, to Dr. Frederick A. Wurzbach Jr., Chairman, Banquet Committee, Medical Society of the State of New York, 386 Fourth Ave., New York 16. Admission to the exposition will be free and no tickets are required.

Health Forums for the Public.—The Brooklyn Institute of Arts and Sciences, in cooperation with the Brooklyn office of the New York City Department of Health and the Medical Society of the County of Kings and the Brooklyn Academy of Medicine, will sponsor a series of six health forums for the public in the lecture hall of the Brooklyn Academy of Music, 30 Lafayette Ave., Brooklyn. Dr. Harry S. Lichtman, Brooklyn, chairman, public health committee, Medical Society of the County of Kings, will serve as chairman of these free forums, which will be presented at 8:30 p. m.:

Feb. 13, Antibiotics, Max Michael Jr., Brooklyn, Maimonides Hospital; Robert C. Austrian, Brooklyn, Kings County Hospital Center; and Perrin H. Long, Brooklyn, State University of New York, Downstate Medical Center, moderator.

Feb. 27, Heart Surgery—New Help for Hearts, John J. Kelly Jr., M. M. Newman, Frank X. Giustra, Brooklyn, Kings County Hospital Center, and Clarence Dennis, Brooklyn, State University of New York, Downstate Medical Center, moderator.

March 13, The City Protects Our Health, Leonard Greenburg, New York City, comissioner of Air Pollution Control, City of New York; Mr. Jerome B. Trichter, Department of Health, City of New York; and Morris Kleinfeld, Brooklyn, Division of Industrial Hygiene, New York State Department of Labor.

March 27, Accidental Poisonings, Harold Jacobziner, Department of Health, City of New York (The Poison Control Center of the Health Department); Alexander O. Gettler, Ph.D., LL.D., Office of the Chief Medical Examiner, City of New York (The Work of the Chief Medical Examiner's Office); and Henry Rascoff, Brooklyn, Beth-El Hospital, moderator.

April 10, Latest Approach to Cancer, John G. Masterson and Harry Z. Mellins, Detroit, Kings County Hospital Medical Center, and Louis Berger, Brooklyn Jewish Hospital, moderator.

April 24, Nutrition: Food Shapes Our Future (additional sponsor, Brooklyn Nutrition Committee); John H. Browe, Albany, New York State Department of Health; Robert W. Hillman, Brooklyn, State University of New York; Downstate Medical Center; and Miss Mary Fitzgerald, Board of Education, City of New York, moderator.

New York City

Course on Office Proctology.—A course on office proctology will be given Feb. 18-19 at the Mt. Sinai Hospital in affiliation with Columbia University. The course, designed to acquaint the clinician with the important proctologic conditions that lend themselves to office diagnosis and treatment, will include demonstration of all diagnostic and various therapeutic procedures. The fee is $50. For information, address the Registrar for Postgraduate Medical Instruction, Mount Sinai Hospital, Fifth Avenue and 100th Street, New York 29.

PENNSYLVANIA

Philadelphia

Meeting on Medical History.—At the meeting of the section on medical history, College of Physicians of Philadelphia, Feb. 12, 8:30 p.m., John Lawrence's "Oration on the Birthday of Medical Honors in America" (First Medical Commencement Address, University of Pennsylvania, 1768) will be given, translated from the original Latin, with a review of the author's life, by Dr. Herbert James Dietrich Jr., Haverford, Pa. "John Redman: Medical Preceptor of Philadelphia," will be the subject of Whitfield J. Bell Jr., Ph.D., associate editor of "The Papers of Benjamin Franklin." The Edward Bell Krumbhaar Award in Medical History (Medical Student Prize Essay Contest, College of Physicians of Philadelphia) will be presented, with remarks by Dr. Stanley P. Reimann, Lankenau Hospital of Philadelphia. All who are interested are welcome.

TENNESSEE

Venereal Disease Conference.—The 26th Venereal Disease Postgraduate Conference for Physicians, sponsored by the University of Tennessee College of Medicine, Memphis, and the Public Health Service, will be held at the college of medicine April 18-20. The course is designed to acquaint the practitioner with the latest developments in the venereal diseases. Discussion leaders will be drawn from university faculties, Public Health Service personnel, and other authorities. No tuition will be charged. Applications for admission should be sent to Dr. Henry Packer, University of Tennessee College of Medicine, Memphis 3.

TEXAS

Course on Rheumatic Diseases.—The University of Texas Postgraduate School of Medicine, Houston, will present a course, "Rheumatic Diseases: Present-Day Concepts and Their Management," at Houston, Feb. 27–March 1. Drs. Joseph J. Bunim, Bethesda, Md.; Richard H. Freyberg, New York; and William P. Holbrook, Tucson, Ariz., guest lecturers, will be assisted by faculty members of the postgraduate school. The tuition fee for the course is $40. Application for admission should be mailed to the University of Texas Postgraduate School of Medicine, Texas Medical Center, Houston 25, before Feb. 18.

VERMONT

Scholarships for Course on Pulmonary Function.—The Vermont Tuberculosis and Health Association is offering three $75 scholarships to Vermont physicians to attend a postgraduate course for the measurement of pulmonary function in health and disease at the Boston City Hospital, March 25-29. Information may be obtained from Mr. James Bates, Executive Director, Vermont Tuberculosis and Health Association, 187 College St., Burlington.

GENERAL

Course in Neurology.—The University of Kansas Medical Center, Kansas City, will offer a postgraduate course in neurology Feb. 27-28. The guest faculty includes Dr. Joe R. Brown, University of Minnesota Graduate School, Minneapolis-Rochester; Dr. Joseph M. Foley, Harvard Medical School, Boston; Dr. Franklin R. Miller, Snyder Clinic, Winfield, Kan.; and Dr. John A. Segerson, Menninger Foundation, Topeka, Kan. Registration fee for the course is $30. Information may be obtained from the Department of Postgraduate Medical Education, University of Kansas School of Medicine, Kansas City 12, Kan.

Symposium on Myocardial Infarction.—The American College of Cardiology will hold a symposium in the Sert room of the Waldorf-Astoria Hotel, New York, Feb. 16. Topics for discussion will include treatment of shock, arrhythmias, and heart failure in myocardial infarction and use of anticoagulants and diet in the prevention and treatment of myocardial infarction. Speakers will include Drs. David Scherf, New York Medical College, Flower and Fifth Avenue Hospitals, New York City; John W. Gofman and Clarence M. Agress, University of California Medical School, Berkeley–San Francisco; René Biné Jr., San Francisco; J. Roderick Kitchell and Franklin C. Massey, Philadelphia; and Irving Brotman, Washington, D. C. Dr. Simon Dack, New York, will preside, with Dr. Aldo A. Luisada, Chicago, as moderator. Lederle Laboratories will co-sponsor the meeting. The program may be obtained from Dr. Philip Reichert, Secretary, American College of Cardiology, Empire State Building, New York 1.

States Medical Postgraduate Association.—The States Medical Postgraduate Association will hold its annual meeting at a 6 p.m. dinner on the Sunday before the annual congress on medical education and licensure, Feb. 10-12, at the Palmer House, Chicago, under the presidency of Dr. Robert C. Parkin, Madison, Wis.

Allergists Meet in Los Angeles.—The American Academy of Allergy will hold its 13th annual meeting at the Hotel Statler, Los Angeles, Feb. 4-6. The preconvention scientific assembly Saturday and Sunday will include panel discussions on drug allergy, bronchial asthma, atopic dermatitis, and immunology of allergy. Presentations by guest speakers will include:

Dynamics of Adrenal Cortical Activity in Man and Their Relation to Hypersensitivity, Peter H. Forsham, San Francisco.
Experimental and Clinical Results with Histamine Liberators, Bernard N. Halpern, Paris.
Mechanisms of Immunologic Tissue Injury, Russell S. Weiser, Ph.D., Seattle.
Enzymatic Mechanisms in the Action of Complement: Possible Relations to Allergy, Elmer L. Becker, Washington, D. C.
Genetic Basis of Biological Specificity, George W. Beadle, Ph.D., Pasadena, Calif.
Changing Picture of Allergy, Ethan A. Brown, Boston.
Biophysical Characterization of Reaginic and Blocking Sera, John R. Cann, Ph.D., Denver.
Identification of Antigens and Cells by Means of Antibodies, Irving J. Gordon, Los Angeles.

Guests are invited to attend all the meetings. There is no registration fee. A special Honolulu session has been arranged following the meeting in Los Angeles. Planes will depart from Los Angeles at 12:45 p.m., Feb. 7, and will return to Los Angeles on Feb. 19.

Teacher's Conference in Radiology.—The annual Conference of Teachers of Clinical Radiology will convene at the Drake Hotel, Chicago, Feb. 9, under the auspices of the American College of Radiology. There will be a breakfast workshop, "Integration in the Teaching of Radiologic Anatomy," from 7:30 to 9 a.m. The remainder of the morning will be devoted to consideration of "Effective Communication in Education: The Teaching-Learning Process in Audio-Visual Devices." At 2:45 p.m. "The Evaluation of Contrast Media, Truth or Fiction: A Statistician's-Eye View of the Problem" will be discussed. The session will end with a panel on microfilming.

Regional Meeting on Surgery.—The United States section, International College of Surgeons, will hold its mid-Atlantic division meeting in the Greenbrier Hotel, White Sulphur Springs, W. Va., Feb. 10-13. Dr. Elbyrne G. Gill, Roanoke, Va., regent of the section for Virginia, is general chairman of the meeting and, with Dr. Ross T. McIntire, Chicago, executive director of the college, will serve as joint chairman of the program committee. Panels have been scheduled on surgical abdomen, pelvic pain in women, hyperthyroidism, low back pain and sciatica, whiplash injuries, and surgical management of the urinary tract. The following individual presentations will be made:

Surgery of the Neck, Floyd J. Putney, Philadelphia.
Gastrectomy in the Treatment of Peptic Ulcer, George S. Bourne, Roanoke, Va.
Industrial Noise and Occupational Deafness, C. Stewart Nash, Rochester, N. Y.
Management of Abruptio Placenta, Wynne M. Silbernagel, Columbus, Ohio.
Surgery for Deafness, Alfred T. Lieberman, Baltimore.
Surgical Treatment of Coronary Disease and Myocardial Ischemia, Samuel A. Thompson, New York.
Ligation of the Internal Iliac Artery for Carcinoma of the Cervix, August F. Daro, Chicago.
Chemotherapy and the Clinician in Our Present Time-Spaced World, Edwin J. Grace, Brooklyn, N. Y.
Surgical Management of Strabismus (with movies), Elbyrne G. Gill, Roanoke, Va.
Surgery in Many Lands, Virgil T. DeVault, Washington, D. C.
Intracranial Aneurysms, Congenital and Acquired (with movies), Edgar N. Weaver, Roanoke, Va.

Course on Cardiac Arrhythmias.—The University of Kansas School of Medicine will present a postgraduate course on cardiac arrhythmias Feb. 25-26 at the University of Kansas Medical Center, Kansas City. The program is designed specifically to aid the doctor in general practice in the treatment of these anomalies. The guest faculty includes Drs. Samuel Bellet and Calvin F. Kay, University of Pennsylvania School of Medicine, Philadelphia; Herman K. Hellerstein, Western Reserve University School of Medicine, Cleveland; and R. Bruce Logue, Emory University School of Medicine, Emory University, Ga. Registration fee for the course is $30. Information may be obtained from the Department of Postgraduate Medical Education, University of Kansas School of Medicine, Kansas City 12, Kan.

FOREIGN

Congress on Neuropathology.—The third International Congress of Neuropathology will be held in Brussels in conjunction with the first International Congress of Neurological Sciences, July 21-29, 1957. The main themes for discussion will be "Pathology of Extrapyramidal Diseases," "Pathology of States of Consciousness," "Multiple Sclerosis," and "Pathology of Multiple Sclerosis." Dr. Webb E. Haymaker, Washington, D. C., has been elected by the American Association of Neuropathologists as chairman of the U. S. delegation to the congress and Dr. Raymond D. Adams, Boston,

as co-chairman. All inquiries pertaining to presentation of papers at the meeting should be forwarded to Dr. Webb Haymaker, Armed Forces Institute of Pathology, Walter Reed Army Medical Center, 6825 16th St. N. W., Washington 25, D. C.

CORRECTIONS

Allergy Clinic.—In THE JOURNAL (Dec. 8, 1956, page 1405) it was erroneously stated that the first free teaching allergy clinic to be established in West Virginia was opened in July at the Ohio Valley General Hospital, Wheeling. An allergy clinic was established in 1954 at the Charleston Memorial Hospital under the auspices of Drs. Merle S. Scherr and Joseph T. Skaggs.

The Nature of Brucellosis.—In the review of the book "The Nature of Brucellosis," in THE JOURNAL, Jan. 5, page 83, the sentence beginning in the 11th line from the bottom of the review should have read, "The book is enhanced by photographs of several important contributors in the field, but one regrets the absence of his [the author's] own, which modesty, no doubt, forbade."

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 18-20. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

ARKANSAS:* *Examination.* Little Rock, June. Sec., Dr. Joe Verser, Harrisburg.

CALIFORNIA: *Written Examination.* Los Angeles, Feb. 25-28; San Francisco, June 17-20; Los Angeles, Aug. 19-22; Sacramento, Oct. 21-24. *Oral Examination.* Los Angeles, Feb. 23; San Francisco, June 15; Los Angeles, August 17; San Francisco, Nov. 16. *Oral and Clinical for Foreign Graduates.* Los Angeles, Feb. 24; San Francisco, June 16; Los Angeles, Aug. 18; San Francisco, Nov. 17. Sec., Dr. Louis E. Jones, 1020 N St., Sacramento 14.

COLORADO:* *Reciprocity.* Denver, April 9. Final date for filing application is March 11. *Examination.* Denver, June 11-12. Final date for filing application is May 13. Exec. Sec., Miss Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

CONNECTICUT:* *Examination.* New Haven, Mar. 12-14. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic. Examination and Reciprocity.* Derby, March 15. Sec., Dr. Donald A. Davis, Derby.

DISTRICT OF COLUMBIA:* *Examination.* Washington, May 13-14. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N. W., Washington.

FLORIDA:* *Examination.* Miami, June 23-25. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami.

GEORGIA: *Examination and Reciprocity.* Augusta and Atlanta, June. Sec., Mr. Cecil L. Clifton, 111 State Capitol, Atlanta 3.

ILLINOIS: *Examination and Reciprocity.* Chicago, Feb. 4-7. Supt. of Regis., Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

INDIANA: *Examination.* Indianapolis, June 19-21. Exec. Sec., Miss Ruth V. Kirk, 538 K. of P. Bldg., Indianapolis.

KANSAS: *Examination and Endorsement.* Kansas City, June 5-6. Sec., Dr. Lyle F. Schmaus, 864 New Brotherhood Bldg., Kansas City.

MAINE: *Examination and Reciprocity.* Portland, March 12-14. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MICHIGAN:* *Examination.* Ann Arbor and Detroit, June. Sec., Dr. E. C. Swanson, 118 Stevens T. Mason Bldg., West Michigan Ave., Lansing 8.

MINNESOTA:* *Reciprocity.* St. Paul, Feb. 12-13. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: *Examination.* Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Old Capitol, Jackson.

MONTANA: *Examination and Reciprocity.* Helena, Apr. 2-3. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEBRASKA:* *Examination.* Omaha, June 17-19. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEW HAMPSHIRE: *Examination and Reciprocity.* Concord, March 13-14. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 18-21. Sec., Dr. Patrick H. Corrigan, 28 West State St., Trenton.

NEW MEXICO:* *Examination and Reciprocity.* Santa Fe, May 20-21. Sec., Dr. R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

NEW YORK: *Examination.* Albany, Buffalo, New York and Syracuse, Feb. 5-8. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

OHIO: *Endorsement.* Columbus, April 1. *Examination.* Columbus, June 13-15. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA:* *Examination.* Oklahoma City, June 11-12. Sec., Dr. E. F. Lester, 813 Braniff Building, Oklahoma City.

OREGON:* *Examination.* Portland, April 19-20. Office of the Board, 609 Failing Bldg., Portland.

RHODE ISLAND:* *Endorsement.* Providence, March 28. *Examination.* Providence, April 4-5. Administrator, Mr. Thomas B. Casey, 306 State Office Bldg., Providence.

TENNESSEE:* *Examination.* Memphis, March 27-28. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis 3.

TEXAS:* *Examination and Reciprocity.* Fort Worth, June 24-26. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination.* Salt Lake City, July 11-13. Director, Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

VIRGINIA: *Reciprocity.* Richmond, June 12. *Examination.* Richmond, June 13-15. Office of the Board, 631 First St., S. W., Roanoke.

WYOMING: *Examination and Reciprocity.* Cheyenne, Feb. 4. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

ALASKA:*On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

GUAM: *Subject to Call.* Act. Sec., Dr. S. F. Provencher, Agana.

PUERTO RICO: *Examination.* San Juan, March 5-9. Sec., Mr. Joseph Mercado Cruz, Box 9156, Santurce.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: *Examination and Reciprocity.* Tucson, March 19. Sec., Mr. Herbert D. Rhodes, University of Arizona, Tucson.

ARKANSAS: *Examination.* Little Rock, May 6-7. Sec., Mrs. S. C. Dellinger, Zoology Department, University of Arkansas, Little Rock.

COLORADO: *Examination and Reciprocity.* Denver, March 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

CONNECTICUT: *Examination.* New Haven, Feb. 9, Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

DISTRICT OF COLUMBIA: *Reciprocity.* Washington, March 11. *Examination.* Washington, April 22-23. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave. N. W., Washington 6.

FLORIDA: *Examination.* Miami, June 8. Sec., Mr. M. W. Emmel, Box 340, University of Florida, Gainesville.

MICHIGAN: *Examination.* Detroit and Ann Arbor, Feb. 8-9. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., Lansing.

OKLAHOMA: *Examination.* Oklahoma City, April 19-20. Sec., Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.

SOUTH DAKOTA: *Examination.* Vermillion, June 7-8. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

OREGON: *Examination.* Portland, March 2. Sec., Dr. Earl M. Pallett, Eugene.

TENNESSEE: *Examination.* Memphis and Nashville, March 20-21. Sec., Dr. O. W. Hyman, 62 S. Dunlap Ave., Memphis 3.

TEXAS: *Examination.* Austin, April. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WISCONSIN: *Examination.* Madison, April 6, and Milwaukee, June 1. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

ALASKA: *Examination and Reciprocity.* Anchorage and Juneau, first week of February, April, June, August and November. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

*Basic Science Certificate required.

GOVERNMENT SERVICES

AIR FORCE

Personal.—The office of the surgeon general, U. S. Air Force, announces that Col. Victor A. Byrnes has been promoted to the rank of brigadier general. General Byrnes has the aeronautical rating of chief flight surgeon. He was given the Gorgas award for research on retinal burns produced by atomic flash, done during the eight years in which he supervised research in the department of ophthalmology at the School of Aviation Medicine at Randolph Air Force Base, Texas.

ARMY

Chemical Corps Commended on Safety Record.—The Manufacturing Chemists' Association presented a special certificate of commendation to the Army Chemical Corps Dec. 20 at a ceremony at the Army and Navy Club, Washington, D. C. Gen. John E. Hull, U. S. Army (retired), president of the association, said that the accident-frequency rate for both military and civilian personnel of the Chemical Corps compared favorably with private industry for the year 1955 and that the military accident-frequency rate of 2.98 per 100,000 man-days of exposure was especially significant. The Chemical Corps civilian employee accident-frequency rate of 4.04 per million man-hours worked compares favorably with the 12.10 per million man-hours average of "all manufacturing" as reported by the Bureau of Labor Statistics. The Manufacturing Chemists' Association represents over 90% of the productive capacity of the chemical industry. It reports annually on chemical industry safety performance and presents awards to participating chemical companies with the best safety records.

Medical Equipment Development Laboratory.—The development of medical supplies and equipment for the armed services became the responsibility of the Army surgeon general Jan. 1, the Department of Defense has announced. Since 1946 this has been a joint operation, responsibility for its direction rotating among the three services.

The Medical Equipment Development Laboratory at Fort Totten, N. Y., will receive approved projects from and make its recommendations to the Armed Services Medical Matérial Standardization Committee. The laboratory's machine shop is equipped to fabricate prototype models of any item of field medical equipment. Using equipment transferred from the Army's Carlisle Barracks, the laboratory was originally set up under the joint Army-Navy Procurement Office. In 1949 the Air Force Medical Service joined in the operation, the office was renamed the Armed Services Medical Procurement Agency, and the development laboratory was designated a branch of that agency.

Personal.—Col. Floyd L. Wergeland, M. C., presently on duty at the Command and General Staff School, Fort Leavenworth, Kan., has been named to succeed Col. Joseph H. McNinch, M. C., as chief, personnel division, office of the surgeon general. Colonel Wergeland will assume his new duties early in February when Colonel McNinch goes to the Far East.

NAVY

Annual Symposium at Naval Hospital.—The fifth annual Military Medico-Dental Symposium under the auspices of the commandant, First Naval District, will be held at the Naval Hospital, Chelsea, Mass., and civilian institutions in Boston, March 20-22. The theme of the symposium is "The World-Wide Significance of the Preventive Aspects of Military Medicine and Dentistry." The program has been planned to provide information for reserve and regular medical department officers on current concepts in varied fields of endeavor in the medical and dental services of the armed forces.

The meeting on the first day will be conducted at the Naval Hospital in Chelsea. On the morning of the second day a tour of the School of Public Health of Harvard University will be conducted by Dr. John C. Snyder, dean of the school, following which lectures will be given at Jimmy Fund Auditorium, where they will be given also on the third morning. Afternoon lectures for the third day will be given at the Jimmy Fund Building as well as in the Joslin Auditorium at the New England Deaconess Hospital and at the Naval Hospital, Chelsea.

Among the guests and speakers on the opening day of the symposium will be Frank Berry, Assistant Secretary of Defense, Health and Medicine; Rear Adm. Bartholomew W. Hogan, surgeon general of the Navy; Major Gen. Silas B. Hays, surgeon general of the Army; Dr. Howard Root, president, Massachusetts Medical Society; Capt. Shields Warren, Naval Reserve, professor of pathology, Harvard Medical School; Dr. Chester S. Keefer, director, Boston University School of Medicine; and Agnes Ohlson, R.N., president, American Nurses' Association. Capt. R. Cannon Eley, Naval Reserve, assistant clinical professor of pediatrics, Harvard Medical School, is general chairman of the symposium, which is approved for retirement point credit for attendants who are on the active list in the armed services reserve program, providing they register with the authorized military representative assigned the duty of recording daily attendance. Information may be obtained from the District Medical Officer, First Naval District, 495 Summer St., Boston 10.

New President of American Board of Psychiatry and Neurology.—Capt. George N. Raines, M. C., was elected president of the American Board of Psychiatry and Neurology at its annual meeting in New York, Dec. 9. He is the first military medical officer on active duty to be so honored. Captain Raines has served as a director of the Board since 1940 and served as vice-president last year. Captain Raines is head of the neuropsychiatry branch of the Navy's Bureau of Medicine and Surgery and is director, department of psychiatry, Georgetown University School of Medicine, Washington, D. C.

VETERANS ADMINISTRATION

Hospital Site Condemnation Suit.—The United States government has filed an amendment to its condemnation suit for about 25 acres of land near Rockville, Md., for a new 500-bed Veterans Administration hospital to replace the present Mount Alto Hospital in Washington, D. C. The suit was amended to realign the boundaries of the site to tie in with Rockville city's street planning and to provide street access to the hospital on three sides. The VA appropriation carried $1,100,000 for design, architectural, and technical services for the new hospital. Construction funds will be requested in the appropriation for the fiscal year 1958.

Hospital News.—Dr. Louis B. Newman, chief, physical medicine and rehabilitation service, VA Research Hospital, Chicago, lectured on "The Role of Physical Medicine and Rehabilitation in Neurological Disorders" before the St. Louis Society of Neurology and Psychiatry, Dec. 4, and on "Physical Medicine and Rehabilitation as Part of Total Patient Care" Dec. 5, before the VA Hospital, Jefferson Barracks, Missouri.

Personal.—Dr. Leon Ross, director of professional services at the VA Hospital, Cleveland, has been appointed manager of the VA Hospital at Brecksville, Ohio, succeeding Dr. Willard L. Quennell, who has transferred to the VA regional office at Detroit. The Brecksville hospital is a 324-bed facility for patients with tuberculosis.

PUBLIC HEALTH SERVICE

Inexpensive Method for Sewage Treatment.—Recent investigations by federal water pollution control engineers in North and South Dakota disclosed one method—the stabilization lagoon—of inexpensive sewage treatment for smaller cities that may cut by two-thirds the costs of conventional plants providing the same degree of treatment. Expanded investigations are now under way by the Public Health Service in a further effort to find ways to reduce costs. Gordon E. McCallum, chief, Water Supply and Water Pollution Control Program of the Public Health Service, said that controlled experiments in Missouri and Ohio are expected to disclose cheaper and better designs.

The stabilization lagoon is a shallow, outdoor collection pond where the sewage undergoes treatment by natural, biochemical action, largely through photosynthesis and the action of algae. It provides the same basic treatment as a typical municipal plant. Before the advent of lagoons, cost of providing sewers and treatment plants was beyond the reach of most small communities. Cost data for the 49 Dakota lagoons studied showed an average per capita cost of $14.84. The studies were made in Kadoka, Wall, and Lemmon, S. D.; and Maddock and Wishek, N. D.

Water pollution control engineers found that the efficiency of these facilities was "very high" in all seasons of the year. The lagoons are small, odor-free, and safe. Waste in lagoons is purified when oxygen-charged bacteria break up sewage solids into gases. Algae in the treatment ponds produce the oxygen needed by these aerobic bacteria, as distinguished from the anaerobic bacteria found in the common septic tank, which need little oxygen.

As a result of experience with lagoons in North and South Dakota, city officials have placed 41 in operation in the former and 32 in the latter state. Throughout the Missouri River Basin there are now 136 such installations, of which 99 treat raw sewage and 37 receive treated sewage. These facilities serve more than 125,000 persons in cities ranging in population from 100 to 11,000 persons.

Research in Hospital Administration and Service.—Surgeon General Burney announced Dec. 21, 1956, four grants for research in hospital administration and service totaling $163,060. Research grants of this type are aimed at finding ways to improve the care of patients and are made in connection with the Hospital and Medical Facilities Survey and Construction (Hill-Burton) Program. The number of projects begun under this research program is now 40, with grants totaling $2,248,250.

The new grants were approved for the following institutions:

St. Vincent's Hospital, New York, to develop scientific personnel systems and methods for hospitals; $33,600 for the first year of a three-year project. Sister Lorette Bernard, R.N., administrator of the hospital, will be project director.

American Hospital Association, Council on Hospital Planning and Plant Operation, Chicago, in cooperation with the American Institute of Architects, for a project in better planning of hospital design; $100,000 for the first year of a three-year project. Clifford Wolfe, secretary of the council, will be project director.

The Joint Blood Council, Inc., Washington, D. C., for a nationwide survey to develop standard terminology for describing the work of blood-bank technicians and standards for use in accrediting blood banks; $25,000 for the first year of a two-year project. Dr. Frank E. Wilson, executive vice-president of the council, will be project director.

University of Oregon Medical School, Portland, for a study of needs in training medical technologists; $4,460. Dr. Frank B. Queen, professor of pathology, will be principal investigator.

DEATHS

Vavasour, James Francis ✱ Northport, N. Y.; born in Albany, March 11, 1885; Cornell University Medical College, New York City, 1911; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; official adviser in the District Attorney's Office of Westchester County in New York from 1930 to 1945; at one time medical director and senior assistant at the New York City School for Defectives; from 1918 to 1920 chief of the child guidance clinic, department of public welfare in New York City; at various times neuropsychiatrist at the Broad Street Hospital in New York City, clinical assistant at the Neurological Institute of New York City, and physician in charge of the Louden-Knickerbocker Hall in Amityville, N. Y.; formerly assistant chief psychiatrist at the Psychiatric Institute, Grasslands Hospital, Valhalla, N. Y.; for many years on the staff of the Veterans Administration Hospital, where he died Nov. 3, aged 71, of coronary disease.

Goldsborough, Francis Colquhoun, Buffalo; born in Baltimore Sept. 13, 1877; Johns Hopkins University School of Medicine, Baltimore, 1903; professor of obstetrics and gynecology emeritus at the University of Buffalo School of Medicine, where he joined the faculty in 1910; served on the faculty of his alma mater; specialist certified by the American Board of Obstetrics and Gynecology; member of the American Gynecological Society; an associate member of the American Medical Association; fellow of the American College of Surgeons; past-president of the Buffalo Academy of Medicine and the first president of the Buffalo Obstetrical and Gynecological Society; veteran of World War I; consultant in obstetrics at Buffalo General and Edward J. Meyer Memorial hospitals; served as a member of the advisory board of the Children's Hospital; died Nov. 8, aged 79, of bilateral carcinoma of the lung.

Simpson, Morris Bigelow ✱ Kearney, Mo.; born in Buffalo, Kan., Dec. 29, 1886; University Medical College of Kansas City, 1913; awarded the French Croix de Guerre and the British Military Cross, while serving as a captain in the British Medical Corps; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, Pan American Ophthalmological Society, World Medical Association, and the Industrial Medical Association; past-president of the Jackson County Medical Society, Missouri State Medical Association, Kansas City Southwest Clinical Society, and the Kansas City Society of Ophthalmology and Otolaryngology; practiced in Kansas City, where he was on the staffs of the Research and St. Mary's hospitals; died Nov. 10, aged 69, of acute coronary thrombosis.

Bray, Harry Alfred, Saranac Lake, N. Y.; born in 1880; Trinity Medical College, Toronto, Canada, 1904; L.R.C.P., of Edinburgh, L.R.C.S., of Edinburgh, and L.R.F.P. & S., Glasgow, 1905; member of the Medical Society of the State of New York and the American Trudeau Society; fellow of the American College of Physicians; formerly associate professor of medicine at the Albany (N. Y.) Medical College and lecturer in tuberculosis at the Cornell University Medical College in New York City; served as a member of the faculty of the Trudeau School of Tuberculosis in Saranac Lake, as director of the Ray Brook (N. Y.) State Tuberculosis Hospital, as associate attending physician at the Albany (N. Y.) Hospital, as member of the consulting staffs of the Physicians and Champlain Valley hospitals in Plattsburg; died Nov. 15, aged 76.

Critchfield, Lyman Ray ✱ St. Paul; born in Hunter, N. D., May 9, 1886; University of Minnesota College of Medicine and Surgery, Minneapolis, 1909; clinical assistant professor emeritus of pediatrics at his alma mater, now known as the University of Minnesota Medical School; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; served as a member of the governor's advisory council on mental health; a member of the board of directors of the Minnesota Tuberculosis and Health Association; on the staffs of the Ancker, Charles T. Miller, Children's, Gillette State, Crippled Children's, Midway, Mounds Park, and St. Joseph's hospitals; died in the University of Minnesota Hospital in Minneapolis, Oct. 31, aged 70, of carcinoma of the stomach.

Shafer, Rudolph Jonas ✱ Corning, N. Y.; born in New York City March 7, 1893; Tufts College Medical School, Boston, 1916; member of the American Society of Clinical Pathologists; served as president of the New York State Society of Pathologists; a council member and past-president of the New York State Association of Public Health Laboratories and a director of the American Cancer Society; formerly secretary-treasurer of the Steuben County Medical Society; a director of the Steuben County Laboratories; served on the staffs of the Bath (N. Y.) Hospital, and St. James Mercy and Bethesda hospitals in Hornell; pathologist at Corning Hospital; died Oct. 29, aged 63, of coronary thrombosis.

Gosselin, George Adelor ✱ Hartford, Conn.; born in Rutland, Vt., Feb. 1, 1889; University of Vermont College of Medicine, Burlington, 1915; member of the

✱ Indicates Member of the American Medical Association.

American Psychiatric Association; specialist certified by the American Board of Psychiatry and Neurology; past-president of the Connecticut Psychiatric Association; consultant at the Veterans Administration Hospital in Newington, Norwich (Conn.) State Hospital, Windham Community Memorial Hospital in Willimantic, Waterbury (Conn.) Hospital, New Britain (Conn.) General Hospital, State of Connecticut Veterans' Home and Hospital, Rocky Hill, and St. Francis Hospital; died Nov. 25, aged 67.

Newell, Hodge Albert ✦ Henderson, N. C.; born in Mapleville, Aug. 22, 1883; College of Physicians and Surgeons, Baltimore, 1906; veteran of World Wars I and II; for 25 years chairman of the city school board; in May, 1956, was given the Fifty Year Service award of the Medical Society of the State of North Carolina; past-president of the North Carolina Hospital Association; for many years medical director of the Maria Parham Hospital, which he was instrumental in building; for 20 years a surgeon for the Seaboard Airline Railroad; charter member of the Henderson Rotary Club; died in the Rex Hospital, Raleigh, Nov. 2, aged 73, of carcinoma of the pharynx.

Downey, Henry Arthur R. ✦ West Springfield, Mass.; born Aug. 12, 1875; Medico-Chirurgical College of Philadelphia, 1898, for many years school physician; a director of the West Springfield Trust Company and an executive committee member of the Third National Bank and Trust Company; during World War II a medical examiner for Selective Service; member of the staff of the Springfield, Mercy, and Wesson Memorial hospitals in Springfield; in 1953 honored by the Chamber of Commerce when he received its Distinguished Service award; died Nov. 15, aged 81, of heart disease.

Eveleth, Malcolm Standish ✦ New Haven, Conn.; born in Washington, D. C., Feb. 5, 1913; Johns Hopkins University School of Medicine, Baltimore, 1938; specialist certified by the American Board of Orthopaedic Surgery; associate clinical professor of orthopedic surgery at Yale University School of Medicine; interned at the University Hospitals in Cleveland, where he served a residency; formerly a resident at the New Haven Hospital; on the staffs of the Grace–New Haven Community Hospital and the Hospital of St. Raphael; died Nov. 8, aged 43, of coronary occlusion.

Watkins, Royal Phillips ✦ Princeton, Mass.; College of Physicians and Surgeons, medical department of Columbia College, New York City, 1892; for many years practiced in Worcester, Mass., where he was consulting surgeon at the City, Fairlawn, St. Vincent, Hahnemann, and Memorial hospitals; fellow of the American College of Surgeons; for many years member of the Massachusetts Board of Registration in Medicine, which he served as chairman; died in the Worcester (Mass.) City Hospital Oct. 19, aged 88, of arteriosclerotic heart disease.

Riegelman, Laura M. Long, Brooklyn, N. Y.; born in 1866; New York Medical College and Hospital for Women, Homeopathic, New York City, 1890; Woman's Medical College of Baltimore, 1897; member of the Medical Society of the State of New York; for 19 years chief of the bureau of child hygiene in Brooklyn; retired Dec. 31, 1938, after 40 years of service with the city department of health; died Nov. 6, aged 90, of coronary occlusion and hypertensive cardiovascular disease.

Arritt, A. M., Partlow, Va.; Medical College of Virginia, Richmond, 1906; died in Fredericksburg Oct. 31, aged 78, of cerebral hemorrhage.

Barker, Ernest Milton, Jacksonville, Ark.; University of Arkansas School of Medicine, Little Rock, 1944; veteran of World War II; served on the staff of the Veterans Administration Hospital in North Little Rock; died Nov. 17, aged 42.

Barnum, Emerson ✦ Shelbyville, Ind.; Medical College of Indiana, Indianapolis, 1904; served as county health officer; on the staff of the William S. Major Hospital; died Sept. 28, aged 73, of cardiovascular renal disease.

Boucher, R. T., Wellington, Texas (licensed in Texas, under the Act of 1907); died Oct. 25, aged 80.

Goggans, Roy, Dallas, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; member of the Texas Medical Association; director of the tuberculosis control clinic, city of Dallas Health Department; for many years superintendent of the Woodlawn Sanatorium; died in St. Paul's Hospital Nov. 4, aged 67.

Goldberg, Louis Edward ✦ Newark, N. J.; University of Vermont College of Medicine, Burlington, 1924; specialist certified by the American Board of Pediatrics; fellow of the American Academy of Pediatrics; chief of pediatrics at the Newark Beth Israel Hospital and the Essex County Isolation Hospital in Belleville; died Sept. 24, aged 56, of coronary thrombosis.

Gresham, Walter Asa ✦ Russellville, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1900; served overseas during World War I; past-president of the Franklin County Medical Society; president of the Citizens Bank and Savings Company; formerly member of the city council; died in the Franklin County Hospital Oct. 31, aged 82, of cancer.

Guerra, Raul Lopez ✦ Fort Worth, Texas; Universidad Nacional Facultad de Medicina, Mexico, D. F., 1923; died in Leon, Guanajuato, Mexico, Sept. 18, aged 58, of a heart attack and uremia.

Haigh, Susanna Edwards Schuyler ✦ New York City; Columbia University College of Physicians and Surgeons, New York City, 1921; member of the American

Psychoanalytic Association; for many years on the faculty of the New York Psychoanalytic Institute; died Nov. 7, aged 62, of coronary thrombosis.

Hammond, Alfred F., Pollocksville, N. C.; University College of Medicine, Richmond, 1903; died in the Duke Hospital, Durham, Oct. 30, aged 81.

Held, William, Chicago; Jenner Medical College, Chicago, 1902; died in St. Elizabeth Hospital Nov. 13, aged 85.

Hicks, Andrew Reginald ✦ Warwick, N. Y.; New York Medical College, Flower and Fifth Avenue Hospitals, New York City, 1939; certified by the National Board of Medical Examiners; served during World War II and was awarded the Bronze star and the Legion of Merit citation; chief of staff of St. Anthony's Hospital; died Nov. 4, aged 46.

Houghton, Donald Charles ✦ Rochester, N. Y.; Harvard Medical School, Boston, 1924; fellow of the American College of Surgeons; member of the Rochester Academy of Medicine; consulting surgeon at Strong Memorial Hospital, Rochester Municipal Hospital, and the Rochester General Hospital, where he died Nov. 5, aged 56, of cerebral hemorrhage and hypertension.

Jacobs, Guy Rigby, Lynn, Mass.; Middlesex University School of Medicine, Waltham, Mass., 1924; served overseas during World War I; for many years on the staff of the Lynn Hospital; died Oct. 7, aged 66.

Johnson, William Adams ✦ Iowa Falls, Iowa; State University of Iowa College of Medicine, Iowa City, 1933; county coroner; veteran of World War II; on the staff of the Ellsworth Municipal Hospital; died Oct. 3, aged 47, of myocardial infarction due to coronary thrombosis.

Keen, Burlin Everett, Des Moines, Iowa; St. Louis University School of Medicine, 1926; veteran of World War II; died in the Methodist Hospital, Rochester, Minn., Oct. 10, aged 62, of ruptured abdominal aortic aneurysm.

Kennedy, William Clement ✦ Middletown, Conn.; Georgetown University School of Medicine, Washington, D. C., 1911; served during World War II; practiced in Torrington, where he was on the staff of the Charlotte Hungerford Hospital; died in the Middlesex Memorial Hospital Nov. 18, aged 74.

Kirkham, Judd Harris ✦ Kerrville, Texas; Milwaukee Medical College, 1912; fellow of the American College of Surgeons; member of the American Trudeau Society; president of the Kerrville Rotary Club; manager of the Veterans Administration Hospital, where he died Sept. 23, aged 67, of coronary thrombosis.

Lehman, Charles A., Williamsport, Pa.; Jefferson Medical College of Philadephia, 1905; an associate member of the American Medical Association; consultant at the Williamsport Hospital, where he was past-president of the staff and chief of obstetrics; past-president of the Lycoming County Medical Society; retired director of the Bank of Newberry; died Oct. 18, aged 77.

Lindquist, Charles Ariel ✦ Los Angeles; Jefferson Medical College of Philadelphia, 1923; fellow of the American College of Surgeons; member of the Industrial Medical Association; veteran of World War I; served on the staff of the Santa Monica (Calif.) Hospital; died in Jerome, Idaho, Oct. 31, aged 59.

MacDonald, George Fulton ✦ Tarentum, Pa.; University of Pittsburgh School of Medicine, 1913; member of the American Academy of General Practice; chief of the urologic staff, Allegheny Valley Hospital; died Oct. 28, aged 66, of coronary occlusion.

Maeth, Joseph Leo ✦ Santa Monica, Calif.; St. Louis University School of Medicine, 1927; veteran of World War II; died Nov. 1, aged 54.

Macy, Frederick Stevens ✦ Lieut. Col., U. S. Army, retired, Manchester, Maine; Tufts College Medical School, Boston, 1897; commissioned a first lieutenant in the Medical Corps of the U. S. Army in 1907; rose through the various ranks to that of lieutenant colonel; retired Dec. 31, 1922, for disability in line of duty; died in Detroit, Aug. 9, aged 80, of heart disease.

Maher, Thomas Francis, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; on the staff of St. Bernard's Hospital; died Nov. 26, aged 79, of arteriosclerosis.

Maynard, Herbert Ernest ✦ Boston; Boston University School of Medicine, 1902; veteran of World War I; served on the staffs of the Winchester (Mass.) Hospital and the Hahnemann Hospital, where he was president emeritus and at one time chief surgeon; died in Winchester Nov. 7, aged 78, of heart disease.

Meyers, Hyman Bernard, Miami Beach, Fla.; Tufts College Medical School, Boston, 1914; died in the Peter Bent Brigham Hospital, Boston, Nov. 6, aged 71.

Moore, James Spencer ✦ East Providence, R. I.; Harvard Medical School, Boston, 1898; died in the Rhode Island Hospital, Providence, Oct. 1, aged 85, of arteriosclerosis.

Morley, Francis Joseph ✦ Concord, Calif.; University of Colorado School of Medicine, Denver, 1927; served on the staffs of the Pittsburg (Calif.) Community Hospital and the Herrick Memorial Hospital in Berkeley; died in St. Luke's Hospital, San Francisco, Oct. 25, aged 57, of congestive heart disease.

O'Hara, Andrew Monroe, Sneads, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1916; member of the Florida Medical Association; died in the Jackson Hospital, Marianna, Sept. 20, aged 67, of carcinoma of the stomach.

Ossendorff, Kurt W. ✦ Chicago; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1911; member of the American Academy of General Practice; on the staffs of Columbus and St. Joseph hospitals, and the Alexian Brothers Hospital, where he died Nov. 23, aged 70, of bronchopneumonia and carcinoma of the kidney.

Ribbans, Robert Clark ✦ Newark, N. J.; New York University Medical College, New York City, 1897; fellow of the American College of Surgeons; on the emeritus staff of East Orange (N. J.) Hospital; on the adjunct staff of the Presbyterian Hospital and Hospital of St. Barnabas and for Women and Children; died Nov. 12, aged 83.

Rypko, Chaim, Brooklyn, N. Y.; University of Moscow Faculty of Medicine, Russia, 1918; died in the Kings County Hospital Oct. 2, aged 73, of brain tumor.

Saylor, Benjamin Franklin, Redding, Calif.; Homeopathic Medical College of Missouri, St. Louis, 1897; St. Louis University School of Medicine, 1903; served as city health officer and county health officer; died July 11, aged 81.

Schwebel, Samuel ✦ Youngstown, Ohio; Jefferson Medical College of Philadelphia, 1932; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; died in Youngstown Hospital, North Side Unit, Oct. 18, aged 49, of coronary thrombosis.

Shattuck, Warren S., Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1893; an associate member of the American Medical Association; specialist certified by the American Board of Otolaryngology; member of the American Laryngological, Rhinological and Otological Society and the American Otological Society, on the staff of the Brooklyn Eye and Ear Hospital; died in the Brooklyn Hospital Sept. 12, aged 86.

Smith, Inman Parker ✦ Rome, Ga.; University of Louisville (Ky.) School of Medicine, 1928; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; died in the Floyd Hospital Oct. 5, aged 53, of acute coronary thrombosis.

Sprague, William Giles, Barker, N. Y.; Trinity Medical College, Toronto, Canada, 1891; an associate member of the American Medical Association; served many years as Somerset health officer and school medical examiner; formerly vice-president and director of the Somerset Bank; died Sept. 28, aged 90, of arteriosclerosis.

Steele, Lonzo Edward, Logan, W. Va.; University of Nashville (Tenn.) Medical Department, 1904; an associate member of the American Medical Association; an honorary life member of the West Virginia State Medical Association; served on the staff of the Logan General Hospital; died Nov. 16, aged 76.

Stimpson, Arthur James ✦ Kennebunk, Maine; Medical School of Maine, Portland, 1894; veteran of World War I; served on the staffs of the Webber Hospital in Biddeford and the Maine General Hospital in Portland; died Aug. 9, aged 85, of cerebral hemorrhage.

Taylor, George Washington ✦ Lieut. Commander, U. S. Navy, retired, Coronado, Calif.; Tulane University School of Medicine, New Orleans, 1914; entered the Medical Corps of the U. S. Navy in 1916 and retired June 30, 1938; fellow of the American College of Physicians; died in the U. S. Naval Hospital, San Diego, Oct. 4, aged 66, of arteriosclerosis.

Thacher, Henry Clarke, New York City; Johns Hopkins University School of Medicine, Baltimore, 1906; member of the Medical Society of the State of New York; formerly on the faculty of Columbia University College of Physicians and Surgeons; served as consultant at the Vassar Brothers Hospital in Poughkeepsie and the Roosevelt and Lincoln hospitals; died Oct. 30, aged 75, of gastrointestinal hemorrhage.

Thompson, Columbus M., Kings Mountain, Ky.; Eclectic Medical Institute, Cincinnati, 1891; died Oct. 31, aged 91.

Tracy, Julius Ross, Anderson, Ind.; Indiana University School of Medicine, Indianapolis, 1909; veteran of World War I; on the honorary staff of St. John's Hospital, where he died Nov. 1, aged 69, of bronchopneumonia, Paget's disease, and aplastic anemia.

Van Allen, Lew Knapp ✦ Ukiah, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1909; served as health officer; died Oct. 8, aged 76, of cancer.

Wheeler, Wiley H. ✦ Olive Hill, Ky.; Tennessee Medical College, Knoxville, 1901; died Oct. 15, aged 78, of a heart attack.

Widdowson, Frank R., Philadelphia; Jefferson Medical College of Philadelphia, 1906; an associate member of the American Medical Association; died Sept. 8, aged 81, of heart disease.

Wood, Harry Almon, St. Petersburg, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886; died Sept. 24, aged 92, of hepatic insufficiency and choledocholithiasis.

Wrenn, William Joseph ✦ York, Ala.; University of Alabama School of Medicine, Mobile, 1908; died in Sumter County Hospital Sept. 24, aged 75, of coronary occlusion.

Zimmermann, William ✦ Quincy, Ill.; Washington University School of Medicine, St. Louis, 1897; on the staff of the Blessing Hospital, where he died Oct. 23, aged 83, of arteriosclerotic heart disease.

FOREIGN LETTERS

AUSTRIA

Otosclerosis.—At the meeting of the Medical Society of Vienna on Nov. 16, H. Dworacek described a new operation for the improvement of loss of hearing due to otosclerosis. An attempt is made to loosen and remobilize the fixed stapes with the aid of a microscope, magnifying to 40 times. This operation, introduced by Kessel in 1875 and reintroduced and modified by Rosen in 1953, was performed on 16 patients. It was carried out through a speculum and consisted in loosening the stapes from the membranous acoustic canal and in lifting the tympanum. Although remarkable improvement was obtained in about 50% of the patients, so that they were socially and professionally rehabilitated, these results are to be considered tentative, since ankylosis of the stapes may recur. O. Novotny suggested, that to avoid fracture of a crus, the manipulations could be transposed to the base of the stapes.

Snoring.—At the same meeting H. Knaus reported on the production and use of a "snoring and mouthclosing bandage," by which snoring can be prevented or at least repressed. Development of this bandage is a result of the observations that snoring might lead, during sleep, to a severe oxygen deficiency and therefore to a dangerous stress, particularly to a damaged heart. This bandage should be used by all patients with heart diseases, by all patients during postoperative sleep, and by all snorers in hospital wards. L. Petrik stated that snoring ceases during treatment of irregularities of the masticating apparatus, particularly of the denture, when regulation is carried out with an "activator". This is an orthopedic apparatus in the form of a double plate, lying loose between the two rows of teeth, that activates the muscles of the jaw, tongue, cheeks, and lips. Its form makes mouth-breathing impossible. The nasal passages must be free, since the patient cannot breathe through the mouth if the apparatus is properly applied. The prevention of mouth-breathing is necessary not only to prevent snoring but also for successful treatment of orthopedic conditions in the jaw.

Anginal Syndrome.—At the same meeting, E. Hueber and H. Thaler reported a three-year experience with a new repository (sustained-action) tablet of glyceryl trinitrate (Nitroglyn). Remarkable results, obtained with repository tablets of 6.5 mg., have been indicated clinically by a sense of heat or headache or experimentally in the angiogram or electrocardiogram of effort. Sixteen patients were carefully studied. Therapeutic success was assumed if the number of attacks fell at least to 50% when the preparation was given and rose again to the previous level when placebo tablets were given. There was a prolonged effect in all patients. Repository glyceryl trinitrate causes a moderate but long-lasting dilatation of the coronary vessels, but even at best a disturbance might be only partially controlled. The negative results of the therapy are explained by the severity of the vascular changes and by a failure of dilatation of the collateral vessels.

Austrian Himalaya-Karakorum Expedition.—At the same meeting, G. Weiler reported on his observations in 10 mountain climbers participating in the 1956 Austrian Himalaya-Karakorum Expedition and 10 sherpas. The first symptom of mountain sickness was Cheyne-Stoke respiration, noted before falling asleep and during sleep, which appeared at a height of over 15,900 ft. This symptom did not cause the subjects to awaken and disappeared after a few days at this altitude. A decrease of appetite was observed only at altitudes over 18,000 ft. Cough occurred in all subjects, but with different intensity. Aphonia occurred in only one, after he had reached the peak, a height of 24,105 ft., but disappeared without treatment after the return to a lower level. Other symptoms of mountain sickness (dizziness, insomnia, headache, and vomiting) probably were prevented by the slow ascent, lasting 19 days, and by administration of vitamin B_{12} tablets during the ascent. Hemolysis and poor coagulability of the blood were observed at a height of over 15,000 ft. During the climb there was a gradual decrease in blood pressure in all 20 subjects. The average total decrease in systolic pressure was 16 mm. Hg. As long as 112 days after descent the systolic pressure did not return to the initial level. The diastolic pressure increased at first and then decreased. The average diastolic pressure did not change in the 10 mountain climbers, but in the sherpas there was an average decrease of 5 mm. Hg. The pulse pressure did not reach the initial values even at the end of the stay at an altitude of 15,900 ft. The average was 29 mm. Hg higher than the initial level in the mountain climbers and 11 mm. Hg in the sherpas.

The differences between the values observed in the mountain climbers and those of the sherpas were due to (1) the fact that the sherpas had lived since childhood at altitudes over 6,900 ft., (2) their repeated staying at higher altitudes for a rather long time, and (3) the better physical condition of the sherpas. A psychological test carried out in seven mountain climbers revealed a diminution of the capacity of concentration and association at an altitude of over 12,000 ft. Weiler concluded that the good acclimation at a height of 15,900 ft. or over during about eight weeks was probably due to administration of vitamin B_{12} and vitamin C tablets.

Iron-Copper-Cobalt Therapy.—At the meeting of the Vienna Medical Society on Nov. 23, E. Undritz of Basel, Switzerland, stated that iron metabolism and the production of hemoglobin are homologous basic

The items in these letters are contributed by regular correspondents in the various foreign countries.

processes in animals as well as in human beings. The so-called physiological anemia in suckling animals is caused by an iron deficiency and can be cured by giving iron. Masked iron deficiency is a widespread condition, which also can easily be reproduced in rats and which disappears after treatment with iron. Iron alone does not stimulate erythropoiesis; only when combined with copper does it produce hemoglobin. Giving cobalt increases the hemoglobin content above normal in the healthy subject. Cobalt, even in smaller quantities, prevents the anemia caused by infections (tuberculosis and others), which does not respond to iron treatment. In man, cobalt prevents disorders of the utilization of iron and normalizes the production of hemoglobin in the anemia caused by such disorders as infections, malignant tumors, leukemia, and diseases of the kidneys, which do not respond to iron and vitamin B_{12}. Certain organic compounds of cobalt, which are much less toxic than the more usual inorganic compounds, are effective. Cobalt, and iron and copper, should be given by mouth, because most of the diseases for which they are given require prolonged treatment.

BRAZIL

Portal Hypertension.—At the 10th meeting of the Interamerican Congress of Surgery, Dr. Palmiro Rocha, São Paulo, reported on a series of 152 patients with portal hypertension. Intrahepatic obstruction was the cause in 149 patients. Only three had an extrahepatic block. Splenomegaly was found in all 152 patients, hepatomegaly in 102, and melena and/or hematemesis in 92. Oligocythemia was found in 103, leukopenia in 90, platelet deficiency in 40, and hypoproteinemia in 65. No relation could be found between the degree of portal hypertension and the presence of esophageal varices. Splenomegaly did not seem to be related to the age of the patient; but the higher the pressure, the larger was the spleen. Gastrointestinal hemorrhage is a definite indication for operation. The author also operates for esophageal varices without hemorrhage. In the presence of ascites controllable by medical treatment, operation is mandatory; but, if the ascites is not controllable by medical treatment, operation is contraindicated.

During an episode of bleeding from esophageal or gastric varices, tamponade with hydrostatic or pneumatic balloons should be used. This should be considered as preparation for such definitive measures as splenorenal or direct portocaval anastomoses. Splenorenal anastomosis could not be performed in 40% of the patients in this series, and direct portocaval anastomosis was not feasible in 13%. The results following splenorenal anastomosis were better than those following splenectomy or direct portocaval anastomosis in lowering of portal pressure and preventing further hemorrhage. No deaths occurred in patients in whom a direct portocaval anastomosis was performed, but in those subjected to a splenorenal anastomosis the death rate was 3.7% and in those whose spleens were removed the death rate was about 7.4%. Ligation of hepatic and/or splenic arteries should not be done for the treatment of portal hypertension, although ligation of the splenic artery may eventually be indicated as a palliative measure for patients with chronic ascites in whom a shunt operation cannot be performed. Splenectomy should be performed only in those patients in whom the portal hypertension is limited to the region of the splenic vein.

Cancer of the Colon.—At the same meeting, Dr. Sylvio D'Avila, Rio de Janeiro, pointed out that, of 22,790 persons who died from cancer in the city of Rio de Janeiro, 11.3% had cancer of the colon. Early signs and symptoms include fever of unknown origin; increased sedimentation rate with no apparent cause; multiple sebaceous cysts; pigmentation or melanin deposits on the lips, buccal mucosa, fingers, or feet; melena; anemia of unknown cause; change in bowel habits; and pain. A digital examination of the rectum, proctoscopic examination, double-contrast barium enema, and exfoliative cytology are the methods used for the detection of an adenoma. The removal of such precancerous lesions should prevent the development of cancer of the colon. The speaker prefers hemicolectomy on the right for cancers of the ascending colon and hemicolectomy on the left for tumors of the descending colon.

Causes of Sterility.—Dr. Arnaldo de Moraes (*An. brasil. ginec.* **42**:125, 1956) classified sterile women into two groups, representing high and low socioeconomic segments of the population. The former were 151 of his private patients, and the latter were 560 of those admitted to the department of gynecology of the university hospital. The sterility was classified as primary if the patient showed a complete incapacity to become pregnant and secondary if pregnancy occurred only once. The author concluded that inflammation of the pelvic organs due to criminal abortion and intrauterine contraceptive treatments is an important cause of sterility. Husbands show little understanding and cooperation in trying to solve the problem, and wives are afraid to shock their husbands' feeling in this aspect of sex. Endocrine and hormonal factors, malnutrition due to poverty, ignorance of food values, alcohol, and verminotic anemia are significant causes of sterility. The incidence of tuberculosis of the pelvic organs in poor women in Brazil (3.3%) is higher than that in the United States, reaching about the same level as that observed in Europe and Israel under the same conditions. No case of genital tuberculosis was found in the author's private practice.

Diabetic Neuropathy.—Many diabetic patients at first seek the care of a neurologist, the diabetic cause of their symptoms being recognized only a posteriori. Dr. H. M. Canelas and co-workers (*Rev. paulista med.* **49**:169, 1956) reported a series of 33 diabetic patients 25 to 66 years old (average 62), the duration of whose diabetes was 1 to 12 years (average 5.1). Twenty patients had normal or above-normal weight for their respective height and age, and 13 below normal. In most of these patients control of the disease was irregular. Sixteen patients had a slight and 17 had a

severe neuropathy. In the latter group the protein content of the spinal fluid and the vibratory perception threshold were increased. In these patients the duration of the disease was longer than in the others, and there was a significant correlation between the threshold of the vibratory perception in the toes and both the duration of the disease and the age of the patients. Weight apparently did not exercise a significant influence on the vibratory perception threshold. Retinopathy was generally associated with severe neuropathy and with a longer duration of the disease. The above findings characterize diabetic neuropathy as a degenerative syndrome progressing simultaneously with diabetic angiopathy.

X-ray Study of the Vagotomized Stomach.—At a meeting of the Associação Paulista de Medicina, Drs. David Rosenberg and Feres Secaf reported that section of the vagus nerve causes great alterations in the tonicity and peristaltism of the stomach. Immediately after section the stomach is dilated and becomes atonic, so that its emptying is greatly retarded. The patient complains of heaviness of the stomach and foul eructations. Although these changes have been described in medical literature as transitory, the authors found that in several patients they persisted for months and even years. Eighteen such patients were followed by means of serial roentgenograms. In 12 of them the changes persisted for more than six years. The follow-up examinations showed that, while in some patients the roentgenographic findings of the stomach became normal in a few months, in others the dilatation and stasis were observed as long as three years after vagotomy.

CANADA

Meeting of Royal College.—At the October meeting of the Royal College of Physicians and Surgeons of Canada in Toronto, Merriman and co-workers of Saskatoon described their attempts to evaluate the PC wave contour and pressures in the diagnosis of mitral valvular disease. They compared data obtained by catheterization of the right side of the heart with direct pressures and wave contours obtained by bronchoscopic puncture of the left auricle and catheterization of the left side of the heart by means of passage of a fine plastic catheter through the bronchoscopic needle into the left auricle, left ventricle, and aorta. In 14 patients with mitral disease the diagnosis was confirmed by operation. The PC wave contours and pressures gave an accurate picture of events in the left auricle. Catheterization of the left side of the heart via a bronchoscope is a relatively safe procedure. Litvak and Vineberg of Montreal discussed two features of their studies of coronary artery surgery. They have been gradually occluding the coronary arteries of experimental animals by using a sleeve of ameroid (made from stainless steel and casein), constriction being due to luminal expansion of the ameroid and local vascular reaction. This technique is helpful in evaluating myocardial revascularizing procedures. These observers are also evaluating left internal mammary arteriocardiopexy in the therapy of coronary artery insufficiency. They transfer the left internal mammary artery without division or ligation to the ventricular surface, attaching it by its transected intercostal branches. Success of the anastomosis seems to depend on removal of the epicardial barrier with special instruments. Mustard and Barnes of Toronto spoke of pump-oxygenators in cardiac surgery. Present-day oxygenators are in two classes—those in which there is contact between blood and a gas, and those in which a membrane is interposed. They use the latter, with donor dog lungs in experimental dogs and monkey lungs for human beings. Their pump provides controlled perfusion with a low degree of trauma to blood cells. They use four monkey lungs (procured from rhesus monkeys after kidney removal for preparation of poliomyelitis vaccine) in the pump circuit, inflated periodically with oxygen as the blood is pumped through them.

Of the five papers on vascular surgery, two dealt with replacement of the thoracic and abdominal aorta in dogs by such prostheses as specially woven polythene tubes (which provide a suitable matrix for invasion by fibroblastic tissue), nylon taffeta tubes (rather hard to handle and more apt to cause postoperative complications), braided nylon tubes (satisfactory), impermeable polyvinyl alcohol tubes (disappointing), and homografts (satisfactory). Two were concerned with revascularization of an extremity after arterial occlusion. Donald Wilson and co-workers of Toronto treated 30 patients by means of grafts and had encouraging results in a follow-up of up to two years. The patient's way of life had often been greatly improved and suffering relieved, even if only temporarily. Luke of Montreal had a series of 36 patients treated by grafting and was getting better results by end-to-side bypass technique of graft application. He had broadened the indications and inserted femoral homografts into 15 patients with severe ischemia and gangrene of the foot. In 12 patients a good foot was maintained and the gangrene was spontaneously cured. Many limbs could now be saved that would otherwise have required supracondylar amputation. Harold Robertson of Toronto reviewed a series of 124 sympathectomies performed for arteriosclerosis or thromboangiitis obliterans of the legs. Limbs that survived the first few postoperative months were usually good for many years in both groups. Robertson showed a low correlation between the extent of the sympathectomy and the physiological and clinical responses, a lack of effect on male potency, and a low incidence of arterial thrombosis.

Beveridge and co-workers of Kingston had studied dietary factors affecting the level of cholesterol in human plasma, using staff members and over 100 university students as volunteers. They showed that there is a factor in animal fats that raises the plasma cholesterol level and a factor in corn oil that lowers it. When a fat-poor diet was used, the plasma cholesterol level fell and stayed constant until corn oil was added, when it fell still further. Of the two papers on psychiatry, one by Stokes of Toronto showed the interesting effects of triiodothyronine in clearing up stupor

in a patient with periodic catatonia, although no relation of the catatonia to thyroid or adrenal cortical function could be demonstrated. Lovett Doust of Toronto drew attention to the remarkable changes in capillary structure and function in schizophrenia, capillary anoxemia leading to local cellular anoxia. Arteriovenous shunts appear to bypass the capillaries in schizophrenia. The mental disturbance may be secondary to a tissue anoxia. Cameron and co-workers of Montreal treated 10 patients with acquired hemolytic anemia of unknown origin with corticotropin and cortisone, with good effect in four patients. In the other six, splenectomy gave encouraging results.

Watt of Toronto analyzed a series of 40 patients with multiple myeloma and divided them into two groups; most patients were dead within a few months, but eight survived for more than three years. He found that a poor prognosis was associated with the finding of marked hyperplasia and immaturity of myeloma cells in marrow, development of macrocytic anemia or pancytopenia, and recurring infection. Two papers were concerned with radiodiagnosis of biliary tract disease. Jutras and Levèsque of Montreal discussed the role of the new oral and intravenous contrast agents in the diagnosis of noncalculous disease of the gallbladder. Elaborate analysis of roentgenograms could lead to frequent diagnosis of cholesterosis, of which they had collected 170 cases. Most constant indirect signs were hyperconcentration, accelerated emptying, and wide and deep contraction rings in the gallbladder. Direct signs included small, multiple, scattered, irregular, unevenly translucent spots and accentuation of the mucosal pattern. Gray of Toronto, who has used sodium iodipamide to examine the biliary tract about 200 times, is satisfied that a high degree of accuracy is obtained and recommends its continued use.

At the Sick Children's Hospital, Toronto, 116 cases of salicylate poisoning were reviewed. The serial determination of the serum pH was found the most important clinical guide in management. The urinary pH was almost always low in salicylate intoxication, even with a high serum pH. Blood sugar changes were not found, and ketosis was not always present. Finlay and Wightman of Toronto compared the roles of a gluten-free diet and cortisone and corticotropin in treating the malabsorption syndrome in 17 adults, 10 with idiopathic steatorrhea and 7 with secondary steatorrhea. In all but one the gluten-free diet caused a remission, although relapse might be expected when the diet was withdrawn. Its effect was slower but more complete than that of cortisone.

American Psychiatric Association.—For the first time a divisional meeting of the American Psychiatric Association was held in Montreal, in November. Dr. Beach, of New Haven, Conn., reported that exogenous androgens can restore normal sexual activity in rats after castration or partial ablation of the testicular cortex and that this activity could be abolished by lesions in the posteromedial portion of the hypothalamus alone. Dr. Fink, of Glen Oaks, N. Y., stated that the degree of clinical improvement in depressed patients given electroconvulsive therapy was related to the amount of delta rhythm in the electroencephalogram and to the amount of disorientation after giving amobarbital intravenously. Dr. Tyhurst, of Montreal, opposed the common view that retirement from work has a bad effect on health. He showed that mortality and morbidity rates in a large group were no worse after retirement and in many cases were lower than average. On retirement there might be a phase of emotional trouble lasting up to one year but this did not persist.

Dr. Heath, of New Orleans, reported tests in nonschizophrenic subjects with a precipitate, Taraxein, obtained from pooled serum of patients with chronic schizophrenia. In small doses this serum produces the clinical findings of simple or paranoid schizophrenia; in large doses it causes a catatonic or hebephrenic response. After intravenous injection of the serum, these effects last for up to two hours in controls and up to four days in the schizophrenic patient. The potency of the extract was tested by measuring spike and wave response in the rostral hippocampus in monkeys with deep electrodes. Extracts from the serum of normal subjects did not produce this localized effect in monkeys. The effect of schizophrenic serum differed from that of lysergic acid in that it caused no autonomic changes. The substance responsible may be a protein or an enzyme. Opinions differed on the value of promazine hydrochloride, which, according to Dr. Morrison, of Houston, Texas, produced prolonged improvement in only a small proportion of patients and tended to cause serious complications such as grand mal, confusional states, and blood changes. Other speakers had a success rate of about 30%. Dr. Wilmer, of Montreal, had been using dimenhydrinate (Dramamine) as an adjunct to supportive psychotherapy. He had obtained improvement in 29 of 40 patients, particularly as regards anxiety and tension headache. The dose never exceeded 200 mg. daily, and side effects were negligible. A negative report was given by Dr. Rudy, of Galesburg, Ill., on two new drugs, MER-22 and SKF-5, both related to azacyclonol, as cortical stimulants in chronic schizophrenia.

New Synthetic Mineralocorticoid.—Drs. Selye and Bois in the *Canadian Medical Association Journal* described a new and extremely active synthetic mineralocorticoid, 2-methyl-9α-chlorocortisol acetate. This steroid is about 400 times as active as desoxycorticosterone acetate in producing cardiovascular damage, fluid retention, and death in rats. The interest of this new steroid lies in its intense activity, for other hormones such as cortisone would have to be produced in immense amounts by the adrenal to cause such connective tissue diseases as periarteritis nodosa with which they have been hypothetically associated. The fact that the new steroid will produce disease at a daily dose level of 5 mg. makes it conceivable that the adrenal cortex can both cause and suppress disease of kidneys and connective tissue by elaborating small amounts of hormones.

Social and Economic Standing of Medical Students.—It is often assumed in Canada that only comparatively well-to-do parents, especially city-dwellers, can afford

to send their sons to medical school. The fallacy of this thinking is exposed by a recent survey made in the University of Alberta, which is a typical state university located in Edmonton, with a population of about 225,000. The executive secretary of the faculty of medicine analyzed the location of the homes of medical students and the occupation of their parents. Study of the location of homes of the 734 medical students enrolled since 1944 (90% of whom came from Alberta) did show a weighting in favor of city-dwellers, but analysis of the figures showed that if the heavy enrollment from Edmonton was excluded, other students were just as likely to come from rural as from urban areas. Although Alberta is largely an agricultural province, the sons of farmers were comparatively poorly represented. About twice as many students came from the professional or business-proprietor classes as would be expected from the actual size of these categories in the general population. Nevertheless, 67% of students came from categories in which the parents' income would be near or below the national average. Thus, the fathers of medical students included laborers, railwaymen, carpenters, miners, barbers, gardeners, janitors, and plumbers. In 29 cases the parents were on a pension. The failure rate of students appeared to have little relation to the student's financial background, although occasionally a student withdrew for a time to improve his financial status by outside work. In such cases he invariably returned after a year or two and completed his course.

National Heart Foundation.—The pattern of activity of the new National Heart Foundation of Canada is now fairly apparent. This foundation received its dominion charter last June, at which time a constitution and bylaws were approved and a board of directors (part medical, part lay) was appointed. At the end of October, the board of directors met and discussed the aims and objects of the foundation and the means of implementing them. The foundation proposes to act as a medical-lay fund-raising body at the national level, coordinating the fund-raising campaigns of provincial bodies and directly seeking funds for research in cardiovascular diseases. Much cardiological research is going on in Canada, but there is now a need to take a look at the picture as a whole, to see which centers are best fitted to do research in particular parts of the field, to eliminate unnecessary overlapping, and to coordinate the efforts of investigators. Although research is the primary interest of the foundation, which now has a cardiologist as a full-time executive secretary, the foundation will also take part in professional education in cardiovascular diseases. The general idea, which has already been applied in Ontario, is to send teams, usually consisting of two cardiologists, to outlying communities to assist local practitioners in the diagnosis and treatment of cardiovascular disease. In addition to lectures and group discussions, the teams will discuss actual cases presented by local men.

At the meeting of the board of directors, whose president is Dr. G. F. Strong of Vancouver, the relationship of the national body to existing and future provincial heart foundations was discussed. The most firmly established provincial heart foundation is the Ontario Heart Foundation, but Quebec, British Columbia, and Saskatchewan have all formed similar organizations. In Manitoba an association is in process of formation, and it is likely that Alberta and the Maritimes will also organize. It is likely that a pattern will develop in which provincial organizations act as divisions of the national body, acting in liaison with it, so as to obtain the greatest national profit from local research projects.

Chronic Constrictive Pericarditis.—Dr. Bigelow and co-workers (*Canadian Medical Association Journal*, Nov. 15, 1956) reported a series of 13 patients on whom they had performed subtotal pericardectomy for chronic constrictive pericarditis. They consider that any patient with this condition who also has an elevated venous pressure, edema, and ascites deserves operation. If the diagnosis is based on radiologic examination without clinical signs, the surgeon must assure himself that the lesion is really hindering the work of the myocardium before operating. Catheterization of the ventricle may show an increase in pressure at the end of diastole, which is a clear indication that cardiac function is impaired. Digitalis should be used before and after operation. The authors favor a transverse incision through the lower end of the sternum and across both sides of the chest. All the pericardium lying over the ventricles must be removed, including the apex and diaphragmatic surface. Removal of pericardium over the right atrium is not particularly important. The 13 patients operated on with a follow-up of one to three years were of an average age of 29 years. There was one operative and one postoperative death. Of the 11 survivors, 8 were in excellent and 2 others were in very good health.

Health Programs of the Future.—In his presidential address to the Canadian Public Health Association this year (reprinted in the *Canadian Journal of Public Health* for November) Dr. G. J. Wherrett listed some 16 voluntary agencies in Canada concerned with individual diseases or groups of diseases, taking these as an indication of the intense interest in health matters taken by the public. Some should be combined, however, and, in order that a suitable distribution of funds may be made, more morbidity surveys at the national level are necessary. Dr. Wherrett suggested that the function of combining such organizations might well be taken over by the Canadian Public Health Association, with the cooperation of other national bodies. In this way health needs could be assessed and programs for fund-raising properly coordinated.

Human Iris Pigment and Schizophrenia.—In the *Canadian Psychiatric Association Journal* (vol. 1, no. 3, 1956) Dr. Ian Kent describes a concept of individual reactivity in relation to iris pigmentation. He presents the various iris colors as a continuum analogous to the spectrum, ranging from absence of pigment at one end of the scale, as in the albino, through increasing

amounts of visible iris pigment toward the black iris at the other end. Maintenance of a relatively constant eye color in any given person is probably a manifestation of biochemical and neurohumoral processes. Dr. Kent suggests that the iris pigment scale provides a basis for estimating a person's specific response to a variety of drugs, such as insulin, reserpine, and chlorpromazine. Over a period of years he has assessed the visible iris pigment in persons and believes it to be a reliable guide to many physiological and psychological characteristics. In particular, a significant percentage of schizophrenic patients have light-colored eyes in the intermediate zone of the iris pigment scale. Investigation of 448 patients (255 schizophrenics and 193 others), together with a survey of 1,292 schoolchildren, showed that the percentage of hospitalized schizophrenics in the mixed iris pigment range at the center of the scale was about three times the percentage of schoolchildren in that range; as a corollary, the extremities of the color range were poorly represented in schizophrenics. In a group of normal subjects in the mid-range on the iris pigment scale, physiological reactions were extremely variable from time to time and from day to day. Such reactions included pulse rate, pulse pressure, respiratory rate, and blood sugar level. These subjects were also of a variable and unpredictable temperament. The author suggests that the specific reactivity of any person to his environment is genetically determined and therefore predictable, at least in part, and is represented in the specific appearance of the iris.

New National Medical Societies.—Two new national medical societies appeared in Canada on Oct. 17. The Canadian Association of Anatomists was formed by anatomists from 10 of Canada's medical schools who met at the University of Montreal and elected officers. The purpose of the association is to advance the science of anatomy in Canada, to hold an annual meeting for presentation of scientific papers, and to cooperate with other scientific bodies in development of scientific programs in Canada. It is not the intention of the association to confine its membership to anatomists in medical schools. Others with a positive interest in anatomy may attend meetings. The other new society is the Pharmacological Society of Canada, which has been two years in the making. It will act in affiliation with the Canadian Physiological Society and has as its object the promotion of the science of pharmacology in its widest sense. Anyone who has conducted research and published papers in pharmacology or is engaged in teaching the subject is eligible for membership. An annual meeting will be held. The new society is eager to offer its services to organized medicine in Canada in the field of pharmacology and therapeutics.

Micrococcic Empyema.—Micrococcic infections have increased recently throughout Canada. Young and newborn children are particularly susceptible to this type of infection. A serious manifestation in young children is empyema. Drs. Mackenzie and McKim (*Canadian Medical Association Journal*, Dec. 1, 1956) reported a program of treatment that they consider of value in treating this condition. Early control of infection, early evacuation of the pleural space, and early reexpansion of the lung are important considerations. The procedure they have found successful in 10 patients consists of the following measures: 1. Early intercostal drainage is performed. As soon as the diagnosis is established the chest is aspirated with a needle, and if pus is found an intercostal catheter is inserted with the patient under local anesthesia. 2. Continuous low-pressure intercostal suction is applied to the catheter by a Steadman pump. 3. Intrapleural instillation of penicillin and streptomycin, chloramphenicol, or erythromycin is done through the catheter every 12 hours. Although organisms were frequently shown to be insensitive to penicillin and streptomycin, a high concentration of these two antibiotics in a small closed space may exert a bactericidal effect. 4. The tendency to loculation is counteracted by instillation of streptokinase and streptodornase into the chest every 12 hours through the drain, alternately with the antibiotics. 5. The patient is given antibiotics systemically and blood transfusions since he is always desperately ill. 6. The drain is removed as soon as normal temperature is maintained.

SWITZERLAND

Transaminase in Coronary Diseases.—P. de Nicola (*Schweiz. med. Wchnschr.* **86**:1145, 1956) has shown that a high serum level of transaminase confirms the diagnosis of myocardial infarction but a normal level does not exclude such a diagnosis. A high transaminase level may, therefore, establish the diagnosis in cases in which the clinical findings and electrocardiogram are atypical. Syndromes of uncomplicated myocardial ischemia never show a marked increase in the serum transaminase level as does typical myocardial infarction.

Oleandomycin.—A new antibiotic was isolated in 1954 by Sobin and co-workers from a strain of streptomyces antibioticus. It is called oleandomycin (Romicil). It was tried on 122 patients with respiratory infections (66 with pneumonia, 16 with pleuropneumonia, 5 with pulmonary abscess, and 35 with purulent bronchitis) by Essellier and Keith (*Schweiz. med. Wchnschr.* **86**:1311, 1956). The authors noted in all patients an excellent and quick response to the antibiotic. One hundred fifty-three patients with urogenital infections were also treated. Bacteriological examinations on these patients before and after treatment with oleandomycin showed the disappearance of almost all gram-positive micro-organisms, while bacteriological action on the gram-negative micro-organisms was rarely observed. Less constant therapeutic results were obtained in these patients. The authors treated a third series of 137 patients with miscellaneous infections. They were able to cure four patients in this group who had septicemia caused by Micrococcus pyogenes var. aureus and Proteus organisms. The drug was given orally in doses of 2 to 3 gm., four to six times a day.

The antibiotic, dissolved in an isotonic sodium chloride solution, was given intramuscularly or intravenously at the rate of 1 to 2 gm. daily. No side-effects and no change in the intestinal flora were observed.

Aldosteronuria.—A mechanism for maintaining the level of sodium chloride in the body operates whenever a sodium chloride deficit is caused by an excessive output or a reduced intake. Muller and Mach (*Schweiz. med. Wchnschr.* **86**:1335, 1956) have observed a direct relation between the expansion or restriction of the fluid volume of the body and the decrease or increase of urinary aldosterone. They studied normal subjects and an obese person with hypertension who was suspected of having Cushing's disease and found that each time the salt intake was reduced aldosteronuria increased. It decreased again when salt was added to the diet in adequate amounts. Six patients with congestive failure, of whom five had never restricted their salt intake, were also studied. With a moderate sodium intake (100 mEq.), the aldosterone output was normal in five of these patients. Four of them were in electrolyte balance, and the fifth retained 85 to 90 mEq. of sodium a day. The aldosterone secretion was elevated in only one patient, who, with an intake of 100 mEq. of sodium a day, excreted only 5 to 10 mEq. and thus increased his cardiac insufficiency. The variations of aldosteronuria were followed in four patients with cardiac disease during the beginning of a salt-poor regimen. Three responded favorably, with a disappearance of their edema. Their aldosterone excretion was low at first. With the restriction of salt, it increased only moderately and slowly, thus facilitating the elimination of sodium from the kidneys. One patient, who did not lose his edema, had an elevated aldosterone excretion at first. With the change in salt intake, his aldosterone excretion increased immediately, thus reinforcing the vicious circle of sodium retention.

UNITED KINGDOM

What Is a Normal Blood Pressure?—An attempt to establish "normal" blood pressure readings was made by H. T. Phillips (*M. Officer* **96**:285, 1956) on the basis of the findings in 3,389 employees of the Bristol Corporation whose ages ranged from 15 to 64 years. The examinations were carried out by 15 physicians. Most of the blood pressure readings were taken with the patient in a seated position. All persons whose medical history and clinical or radiologic findings suggested any condition that might influence the blood pressure were excluded from the study. A further 156 employees were excluded because their blood pressure exceeded a given limit, which ranged from 155/55 mm. Hg in men aged 15 to 19 years to 189/110 mm. Hg in those aged 60 to 64 years. Of these, 125 were 45 years of age or over. Thus, there were 3,233 persons (1,583 men and 1,650 women) in the study. Readings beyond what is commonly regarded as the upper limit of normal were found to be so frequent as to call for some revision of our standards. Phillips proposed a new scale of normal ranges of different ages. For men the range is 108/56 to 143/93 mm. Hg in the 15-to-19-year age group, advancing to 123/71 to 184/105 mm. Hg in the 60-to-64-year age group. The corresponding figures for women are 101/58 to 138/92 mm. Hg in the 15-to-19-year age group, advancing to 125/72 to 180/108 mm. Hg in the 60-to-64-year age group. A fairly steady increase in pressure at each five-year interval was noted. The average increase in the mean pressure per five-year interval was 3.03 mm. systolic and 1.36 mm. diastolic for men and 3.52 mm. systolic and 1.69 mm. diastolic for women.

Sanitation in Glasgow Pubs.—A survey of 50 public houses in Glasgow, made by Wilson and Carter (*M. Officer* **96**:257, 1956), revealed that the toilet arrangements for men were satisfactory in only 10 establishments; hot and cold water was available in only 9 and soap and towels in only 11. For women the toilet arrangements were even worse. In 18 establishments there were no facilities for women. Of the remaining 32, 13 were considered to provide good service. Hot and cold water was available in 11, soap in 16, and towels in 17 (in 8 there were roller towels). In 26 public houses no separate washing facilities were available for the staff. Of the remainder, only 16 had hot and cold water and only 17 provided soap and towels. No soaps or detergents were used for glass washing in 22 establishments. Only 18 of 142 beer glasses examined satisfied the lenient U. S. Public Health Service standard of not more than 100 organisms on the area swabbed. Escherichia coli were isolated from two glasses, and coliform organisms and streptococci were often isolated from clean glasses. Of 93 whiskey glasses examined, only 34 yielded counts of less than 100 organisms; E. coli was found on one. Of the 27 towels used by bartenders that were examined, 14 yielded bacterial counts of fewer than 500 per square inch, and only 14 of 45 samples of wash water yielded a count of less than 500 per milliliter. Overflow beer was found to be contaminated in the catchment trays. It was recommended that spilled beer not be allowed to accumulate in trays all day, as is common practice, and then passed back into the barrel, whether passed through a sieve or not. Lead pipes were used in seven public houses.

Prizes for General Practitioners.—Benger Laboratories Ltd. have established prizes for original observations in general practice. These will be made annually and will consist in the first year of three prizes of $700, $420, and $280 respectively. The prizes are limited to general practitioners anywhere in the world. Entry will be by submission of a written report, in any suitable form, under the general title "An Original Observation of Value in General Practice." This title will be understood to cover subjects involving diagnostic sign, method of diagnosis, technique used in any professional connection, or method of treatment observed or devised by a general practitioner in the course of his own work. Such observations must not have been published and must not be generally known. These observations may be submitted in such appropriate forms as essay, report, or conventional medical paper. Illus-

trations, diagrams, and tables may be used if desirable. The sole criterion of judgment will be the value of the observation as a contribution to the advantage of general pracice. Entries will be judged by the awards committee of the College of General Practitioners. Entries must be received by July 31, 1957, and should be addressed to: Chairman of the Awards Committee, The College of General Practitioners, 54 Sloane St., London, S. W. I. Further details can be obtained from the committee.

Poliomyelitis Vaccination Resumed.—Poliomyelitis vaccination was suspended at the end of June in order to prevent overlapping with the poliomyelitis season. It was resumed in November, and it is hoped that by the end of the year the 27,000 children in England and Wales and the 5,300 in Scotland who received only one injection before the end of June will be able to receive their second injection. It is hoped that regular supplies of vaccine will become available in January, 1957, and that it will then be possible to vaccinate those children who were registered for vaccination in the early summer but whom it was not possible to vaccinate because of shortage of vaccine.

Isoniazid in Lupus Vulgaris.—After four years' experience with isoniazid in the treatment of lupus vulgaris, Russell and Thorne (*Lancet* **2**:808, 1956) report improvement in all of the 103 patients who completed the course of treatment. In 99 patients the lesions were clinically cleared, and in 3 others they subsequently cleared with other treatment. The remaining patient refused local treatment. A follow-up of the 99 patients whose lesions cleared extended for 6 to 24 months after the completion of treatment and revealed relapses in 11. The average length of treatment in the patients with relapses was 32 weeks, compared with 46 in those who did not have a relapse. The average total dose of isoniazid for the patients with relapses was 79.5 gm., compared with 108.5 gm. for those who did not have a relapse. The recommended dosage schedule for adults is 100 mg. three times a day for at least three months after clinical clearance. In practice, this usually means treatment for a year, with a total dosage of about 100 gm. No serious side-effects were encountered; 12 patients had transitory side-effects soon after treatment was started. The introduction of calciferol, and later of isoniazid, has led to the virtual abandonment of actinotherapy for lupus.

Corticotropin in Chorea Gravidarum.—A dramatic response to corticotropin in a primigravida, aged 25, with severe chorea gravidarum and no previous history of rheumatic disease was reported by Forrest and Hales (*Lancet* **2**:874, 1956). The patient was admitted to the hospital on Aug. 27, 1955, and by Aug. 30 (the seventh day of the illness) the choreiform movements were so severe, in spite of treatment, that termination of pregnancy was considered, but it was first decided to try the effect of 120 units of corticotropin daily. Within 24 hours there was a marked improvement, and by the fourth day of treatment the patient was eating normally. The dose of corticotropin was reduced to 80 units daily, gradually reduced still further, and finally stopped on Oct. 21. Choreiform movements had ceased on Oct. 7. The patient was sent home on Nov. 7. On April 3, 1956, she gave birth to a healthy child weighing 7 lb. 10 oz. (3,459 gm.). When last seen on June 5, both mother and child were thriving.

Eye Injuries Due to Fireworks.—Guy Fawkes' day, Nov. 5, is still celebrated nationally by the setting off of fireworks. W. May (*Brit. M. J.* **2**:1039, 1956) investigated the number of cases of eye injuries due to fireworks that required admission to a hospital in London on Nov. 5, 1955. There were 14 such cases, all in males aged 3 to 46. Eleven of these were boys 3 to 14 years of age. These injuries could be divided into those due to flash burns and those due to direct injury by the fireworks. Ten patients were admitted to the hospital with flash injuries involving the eye and the skin around the eye. Nine of these injuries healed rapidly with local treatment and left no permanent damage. One boy, aged 13, suffered burns to both corneas, with severe damage to the left cornea leaving a deep vascularized opacity that limits vision to counting fingers. The four direct injuries were all more serious. One involved a 46-year-old man who was struck in the eye by a falling rocket stick. Three days later the damaged eye had to be excised. Of the other three injured persons, one was left with a blind eye, one with impaired vision, and in the other there was no permanent damage.

New Journal.—The latest addition to the list of new journals is *Physics in Medicine and Biology*, published quarterly by the Hospital Physicists' Association under the editorship of Prof. J. E. Roberts of the Middlesex Hospital Medical School. The aim of the journal is to record original research on the physical properties and constitution of living matter and on the application of physical techniques to medical, biological, and physiological problems. The journal, at an annual subscription of $10.50, is obtainable from Taylor and Francis, Ltd., Red Lion Court, Fleet Street, London, E. C. 4.

WORLD HEALTH ORGANIZATION

Child Health Program.—The executive board of the United Nations International Children's Emergency Fund has approved the spending of $2,747,000 on child health programs in Asia. India's mass program of BCG vaccination is to get $204,000. This is the largest vaccination campaign the world has seen. About 170 million tuberculin tests and 50 million vaccinations will be made. The allocations include $52,000 for maternal and child health services in Afghanistan; $11,000 for handicapped children and $127,000 for fellowship for health personnel in India; $57,000 for handicapped children, $50,000 for milk feeding, and $28,000 for emergency feeding of Hokkaido women and child victims of severe crop failure in Japan; and $99,000 for maternal and child health in Pakistan.

CORRESPONDENCE

BLEEDING AFTER TONSILLECTOMY

To the Editor:—In residency I noted that, in the tonsillectomy cases in which a stitch or two was required, there was very little postoperative bleeding; on the other hand, in 4 to 8% of the clean-cut cases in which there was no immediate need for sutures, bleeding would start four to eight days postoperatively. Thus, in my private practice I have used the following technique and find my incidence of hemorrhages occurring postoperatively is less than 1%, and these are only minor when they do occur.

After the usual preoperative preparation and examination, the following surgical procedure is carried out: I use only the dissection and snare method in tonsillectomy. After removing the tonsils cleanly and completely, each fossa is inspected and any active bleeder is sutured and tied immediately. I use the Davis and Geck 1614-0 tonsil suture with a swedged on ½ curved needle; the needle is entered through the peritonsillar tissue at the junction of the posterior pillar and floor of the fossa at approximately 1 cm. above the lower pole. The needle is inserted just enough to get a good "purchase" or bite of the peritonsillar tissue and is then pulled through. The needle is then carried across the fossa, and a bite of peritonsillar tissue is taken at the junction of the anterior pillar and floor of fossae on the same level. The needle is carried up to within 1 cm. of the top of the fossa and a bite taken at the junction of the posterior pillar and floor of the fossae, and again the needle is carried laterally and a bite taken at the junction of the anterior pillar and fossa floor. This gives a simple "figure-of-8" suture in each fossa. (Since the glossopalatinus and pharyngopalatinus muscles are present in the anterior and posterior pillars, I carefully avoid piercing either of the pillars or incorporating them into the suture in any way.) As you pull up on the suture preparatory to tying, the fossa is automatically narrowed and flattened. You will also notice that neither the anterior or the posterior, or covering, mucosa is distorted in the least and that the sutures are not interfering with the shape of air space of the pharynx. Each suture is tied three times and cut quite close. No astringents or powders or chemicals are used whatever. In my article of 1951 (*Northwest Med.* **50**:936), I used a single suture in the upper fossa, but, with further experience, I prefer using the "figure-of-8." The postoperative pain and dysphagia is no worse than after any routine tonsillectomy.

Thus, the advantages of this simple technique to prevent postoperative tonsil bleeders are (1) no postoperative bleeding; (2) trouble-free postoperative course, with no complications; (3) less raw area remaining to be healed over; and (4) trouble-free sleep for surgeon and operating room staff.

Milton K. Hartzell, M.D.
801 Eugene Medical Center
Eugene, Ore.

THE VALUE OF EXFOLIATIVE CYTOLOGY

To the Editor:—The cytological examination of vaginal secretions initiated by Papanicolaou and Traut has become a routine laboratory procedure in many places. This is offered as a community service in several localities, though considerable doubt exists about the wisdom of such a procedure unless it is combined with thorough clinical examination. Most positive smears come from symptomatic patients who have consulted the physician because of spotting, discharge, or frank vaginal bleeding. In such cases the finding of cancer cells should not be a complete surprise. It is the small group of apparently asymptomatic patients from whom positive smears are discovered that makes the endless hours of reading negative smears seem less of a waste. One source of our work comes from the outpatient department, which sends us smears for routine examination on many old patients and every new patient admitted. A vaginal smear on a new patient, 39 years of age, contained a large number of cancer cells. Much to our surprise, the biopsy was negative. Months elapsed and another smear of the same patient was sent to the laboratory. This presented the identical picture as the previous smear, i.e., a large number of cancer cells. The patient again submitted to biopsy, which was first read as negative. However, because our smears had been definitely positive on two occasions, numerous sections were studied until a very small area of intraepithelial carcinoma was found. Had it not been for two unequivocal smears, persistent cutting of the biopsy material would not have been indicated and the diagnosis would never have been made.

Jan Schwarz, M.D.
F. Senior
Clinical Laboratories
Jewish Hospital
Cincinnati 29.

CALCULATION OF DIETS

To the Editor:—In an article entitled "A Simple Aid in Calculation of Diets" (*J. A. M. A.* **162**:1233 [Nov. 24] 1956) Ralph J. Slonim Jr. states as follows: "In the construction of diets for alteration of the body weight of adults, certain assumptions have long been employed. . . . A person who is mainly sedentary requires a daily dietary allowance of 35 calories per kilogram of body weight. . . . If a person eats more than 35 calories per kilogram of his ideal weight per day, he will gain weight at the rate of 1 gm. of fat plus 1 gm. of water for each 9 calories in excess. If he eats less than the ideal amount, he will lose correspondingly. These assumptions, admittedly only approximately correct, may be used for calculating weight-changing diets, as in this example. An office worker who is 5 ft. 6 in. (167.6 cm.) tall wishes to lose 11 lb. (5.0 kg.) in a month. The required diet is found from the fol-

lowing computations: (1) 11 lb. = 5 kg. = 5,000 gm.; (2) 5,000 gm. ÷ 30 days = 166 gm. per day, equivalent to 83 gm. of fat plus 83 gm. of water per day; (3) 83 gm. of fat is the equivalent of 83 × 9, or 747 calories less than the ideal diet per day to lose 11 lb. in one month."

I must state that I am in disagreement with this thesis. He states that a loss of 166 gm. of body weight is equivalent to a loss of 83 gm. of fat and 83 gm. of water, and that 83 gm. of fat is the equivalent of 83 × 9 or 747 calories. A pound (454 gm.) of body weight, gained or lost, would under these circumstances have a value of 2,042 calories. The following facts are presented that strongly refute this assertion. It was shown by Bozenraad (*Deutsches Arch. f. klin. Med.* **103**:120, 1911) that the average fat content of human adipose tissue taken from various parts of the bodies of well-nourished subjects is 87%. One pound (454 gm.) of human adipose tissue, therefore, contains 395 gm. of fat. The caloric value of 1 gm. of animal fat is 9.5; consequently, the caloric equivalent of 1 lb. of human fatty tissue is about 3,750 calories. Leathes (quoted by Peters and Van Slyke: Quantitative Clinical Chemistry: Volume I: Interpretations, Baltimore, Williams & Wilkins Company, 1931, p. 222) pointed out that carbohydrate and protein cannot be stored dry, but retain with them three or more parts of water, while fat can be stored in an almost pure state. Retention of a gram of fat gives the body 9 calories of reserve energy, while retention of a gram of water-soaked glycogen or protein provides only about 1 calorie. Von Noorden (quoted by DuBois: Basal Metabolism in Health and Disease, ed. 3, Paris, France, DuBois, 1936, p. 261) showed that a daily excess consumption of 200 calories would lead in the course of a year to a deposition of 17 lb. (7.7 kg.) of fat. This would indicate a caloric equivalent of 4,300 calories for each pound of body weight gained. Strang, McClugage, and Evans (*Am. J. M. Sc.* **179**:687, 1930) made a careful study of the influence of low-calorie diets on weight reduction in obese persons. Thirteen patients were placed on a daily diet of 360 calories for a period of 59 days, during which time the average weight loss was 0.6 lb. (272 gm.) per day. It is fair to assume that the number of calories necessary to maintain caloric equilibrium in these patients was 2,500 per day, so that the 0.6 lb. of body weight lost per day had an equivalent of 2,100 calories. One pound would therefore have a caloric value of 3,500. This figure is in marked agreement with the value of 3,700 calories obtained by determination of the caloric value of 1 lb. of human adipose tissue (Bozenraad). It is not far removed from the figure of 4,300 calories determined by Von Noorden. If the figure of 2,042 calories for 1 lb. of body weight, gained or lost, as proposed by Slonim were true, Strang's patients should have lost 1 lb. daily instead of the 0.6 lb. actually lost. The evidence presented is sufficiently cogent to warrant the conclusion that the caloric equivalent of 1 lb. of body weight, gained or lost, is approximately 3,700 calories. (An expatiation of this subject can be found in the following article by me: Caloric Equivalents of Gained or Lost Weight [letter to the editor, *Metabolism* **1**:554, 1052].)

In another part of the article Slonim asserts: "A person who is mainly sedentary requires a daily dietary allowance of 35 calories per kilogram of body weight. If he eats 35 calories per kilogram of his ideal weight, his actual weight, regardless of what it is, will remain constant." The statement made in the second sentence is contrary to fact. Let us take a male, aged 30, 66 in. (167 cm.) tall, with an ideal weight of 140 lb. (63.6 kg.). In the basal state such an individual would have an oxygen consumption of approximately 231 cc. per minute. However, the same individual, if he weighed 250 lb. (113.6 kg.) would have, in the basal state, an oxygen consumption of about 302 cc. per minute. The caloric value of 1 cc. of oxygen would be the same in both cases, because the fasting respiratory quotient in normal individuals is the same, about 0.83. Consequently, in the basal state, the obese individual would expend 31% more calories per unit time than the one with the ideal weight. The diet that would keep the individual with the ideal weight in caloric, and consequently weight, equilibrium would lead to an appreciable loss of weight in the obese individual.

Max Wishnofsky, M.D.
615 Williams Ave.
Brooklyn 7, N. Y.

MUSIC AND MEDICINE

To the Editor:—In connection with the article on page 1619 and the editorial on page 1625 of the Dec. 29 issue of The Journal on music as a tool in medicine, you may be interested to know that the American Rhinologic Society is making available to its members and others, free of cost, tape recordings of music rendered especially for surgery under local anesthesia. The numbers were selected on the basis of 10 years of experience with music during some 1,000 nasal operations by Dr. Maurice H. Cottle at the Illinois Masonic Hospital, Chicago. It was found that patients reacted best to soft string music, but even this had to be screened carefully to avoid numbers that might bring up sad memories. Accordingly, the lesser known classical music was chosen. These compositions were recorded by prominent Chicago artists, including the Fine Arts Quartet. Each 7-in. reel provides three hours of playing. The patient listens to the music through earphones, the surgeon and operating room personnel not being disturbed. American Rhinologic Society members all over the United States are now using these renditions, with uniformly successful results. The music is an important phase in the tranquilizing regimen, making it possible to operate on children from the age of 10 as well as on adults of all ages with the greatest confidence in the efficacy of the preoperative preparatory program. Further information may be obtained by physicians through writing to Mrs. Mabel Campbell, Corresponding Secretary, American Rhinologic Society, 834 Wellington Ave., Chicago 14.

John A. Mirt, M.D.
644 Melrose St.
Chicago 13.

ILLUSTRATED FILM REVIEWS

Illustrated reviews of current films will appear when possible as a regular feature in THE JOURNAL. *They will consist of an introduction by the author followed by a pictorial digest of actual frame enlargements selected as key points of the film. It is planned in the future to publish both the illustrated and printed reviews of current films in the same issue.*

RALPH P. CREER, *Director Motion Pictures and Medical Television, Council on Scientific Assembly.*

SURGICAL TREATMENT OF URETHRAL DIVERTICULUM (FEMALE)

James W. Merricks, M.D., Lowell F. Peterson, M.D.
Frank B. Papierniak, M.D.
and
Ernest M. Solomon, M.D., Chicago

Urethral diverticulum in the female is being diagnosed more frequently today. We have observed 18 cases in persons ranging in age from 18 to 60 years. Common symptoms are burning on urination, dyspareunia, frequency, and dribbling after urination. Vaginal examination usually reveals a tender mass in the anterior vaginal wall. Pressure on the mass may bring pus to the urethal meatus. Cystoscopy and urethroscopy are necessary to determine the size and number of openings of the diverticulum on the floor of the urethra. It may be difficult in some instances to find the urethral opening of the diverticulum. Urethrograms usually show the size and may show the ramifications of the pockets. Treatment is surgical removal of the sac and repair of the floor of urethra.

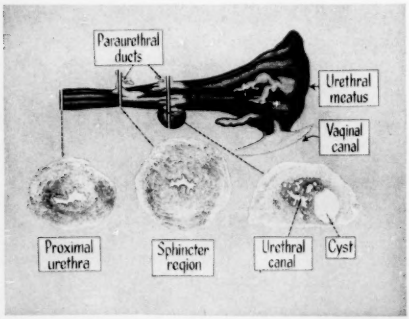

Fig. 1.—Newborn female urethra showing epithelial inclusion cyst adjacent to urethral canal. Later such cysts may communicate with the urethra, resulting in a diverticulum.

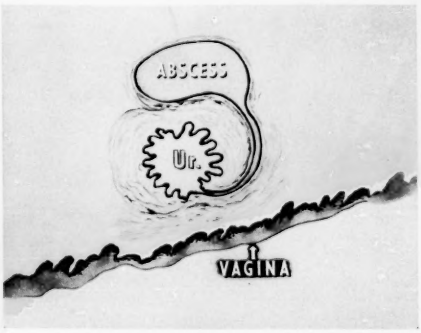

Fig. 2.—An unusual instance of infected diverticulum (abscess) superior to the urethra.

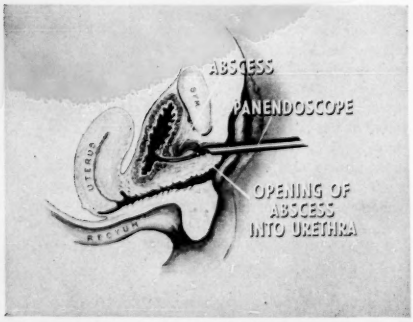

Fig. 3.—Cross section of drawing in figure 2. Note long tract from abscess to floor of urethra.

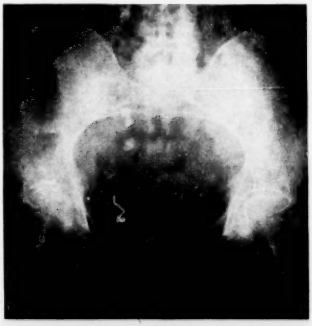

Fig. 4.—X-ray of stone in female urethral diverticulum. Calculi were found in 2 of 18 patients.

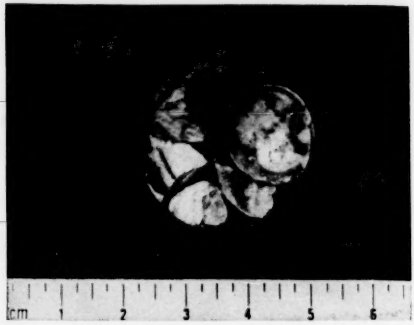

Fig. 5.—Calculus in x-ray (fig. 4) was actually faceted, being in six parts.

Fig. 7.—Urethrogram, using methiodal (Skiodan) sodium, outlines the lateral sacs of diverticulum with stone in center.

History of Surgical Patient

A woman, aged 52, was first seen by us for urinary infection. Cystoscopy then revealed a stricture of urethra with a small urethral diverticulum. She improved with local treatment and was not seen for 15 years. She returned with the complaint of lower abdominal distress when her bladder was full. Some terminal dribbling after urination was present. Urologic findings are described in the following pictures.

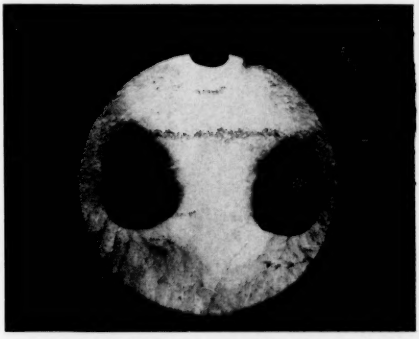

Fig. 8.—Model of cystoscopic view of floor of urethra distal to sphincter. Floor of urethra is just a bridge between two openings of diverticulum. Superior opening is the bladder neck.

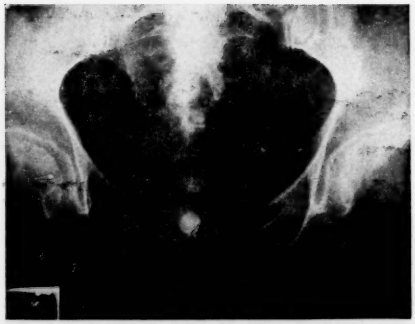

Fig. 6.—X-ray showing calculus in urethral diverticulum of patient to be presented surgically.

Fig. 9.—Close-up of large urethral catheter entering one opening of diverticulum. Note stone below catheter.

Fig. 10.—Vaginal view of diverticulum shown in figures 7-9. Catheter in diverticulum is used as tractor.

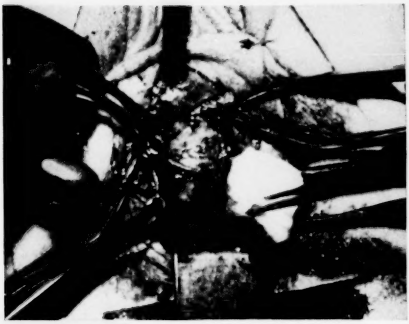

Fig. 13.—Another layer of tissue reflected, leaving only thin inner layer of diverticulum.

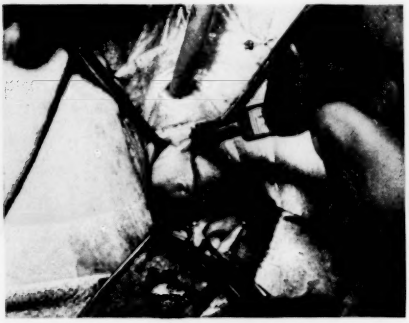

Fig. 11.—Incision carried from near cervix almost to urethral meatus.

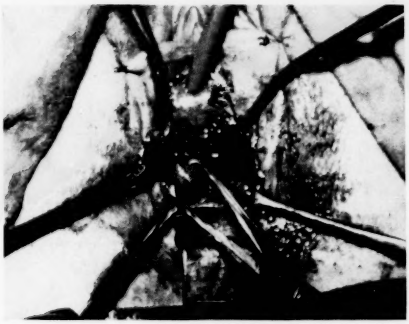

Fig. 14.—Stone removed with forceps. Foley catheter bag removed from diverticulum and inserted into bladder.

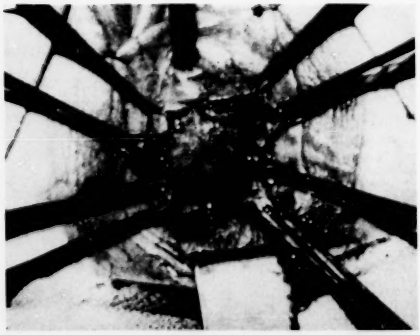

Fig. 12.—Incised vaginal epithelium and fibroelastic supports reflected laterally.

Fig. 15—Demonstration of Foley catheter being pulled through one opening of diverticulum.

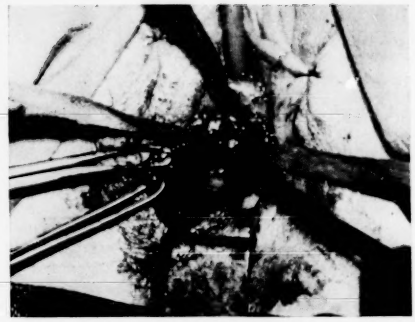

Fig. 16.—Umbilical tape passing under bridge of tissue between openings of diverticulum. Bridge is then removed.

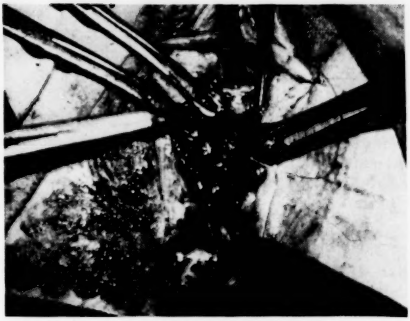

Fig. 19.—More redundant tissue has been resected. Third plane of closure is in progress. Bleeding is well controlled.

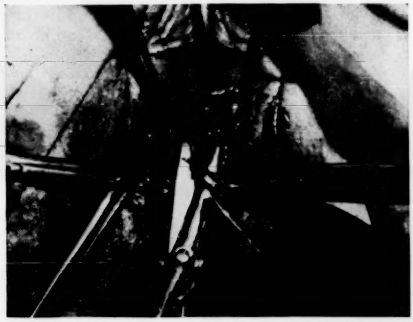

Fig. 17.—Primary plane of closure (chromic absorbable surgical suture 000). Redundant sac wall trimmed.

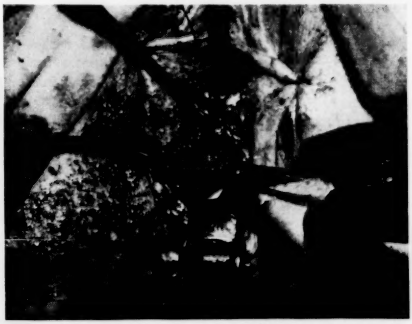

Fig. 20.—Fourth plane of closure including vaginal epithelium, the excess of which has been resected.

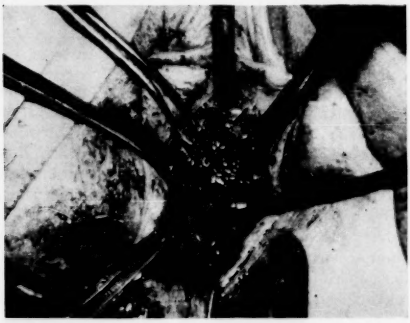

Fig. 18.—Secondary plane of closure. Sutures are placed widely to obliterate the large cavity.

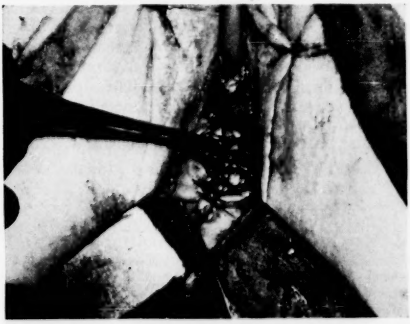

Fig. 21.—Complete closure of vaginal incision.

Summary

The patient was given a sulfonamide, sulfisoxazole (Gantrisin), 5 grains (300 mg.) four times a day, for 10 days. The urethral catheter was removed on the seventh postoperative day. Urinary control was excellent. The patient has remained well for two years.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Prednisone (Meticorten) in the Treatment of Bronchial Asthma: A Clinical Study. S. J. Taub, M. A. Kaplan and A. L. Aaronson. J. Allergy **27**:514-522 (Nov.) 1956 [St. Louis].

Prednisone (Meticorten) was given to 107 adults, 44 children, and 2 infants with severe bronchial asthma. Twenty-three of the 153 patients were hospitalized for status asthmaticus, initially treated with corticotropin (ACTH), and maintained thereafter on prednisone. Eighty-one patients had acute asthma occurring with pollinosis or mold allergy after upper respiratory infection, overexposure to an inhalant allergen, inadvertent ingestion of a food allergen, or administration of a drug or serum and acute reactions after overdosage of a specific allergen. Forty-nine patients had chronic asthma who could not be controlled in the usual manner or in whom the "escape mechanism" occurred from cortisone or hydrocortisone. The patients with acute and chronic asthma were usually ambulatory and were observed at least once or twice weekly in the authors' offices. The usual regimen consisted of an initial dose of 30 mg. of prednisone divided into 6 equal doses of 5 mg. for from 24 to 48 hours. After this, a therapeutic period of 3 to 7 days was started, with doses averaging from 20 to 30 mg. per day. The patients were then placed on maintenance therapy with 5 to 15 mg. of the drug per 24 hours, which was continued for weeks or months. The average patient required from 100 to 120 mg. of prednisone in the first 7 days. The dose schedule was altered slightly to meet the needs of the individual patient, depending on severity of symptoms and response to the drug. Slightly higher initial doses were used in adults as compared to children. The 2 infants received smaller doses than any of the other patients.

An improved emotional state varying from a feeling of well-being and cheerfulness to one of euphoria was the first symptom noted in the hospitalized patient receiving prednisone. In the next 24 to 48 hours the degree of wheezing, cough, dyspnea, and expectoration decreased; the sputum of some patients became thin and clear, as compared to the thick, tenacious, and mucoid material that had been produced previously. In the next period the appetite improved and the ability to sleep and rest was noted. With the continued use of prednisone the need for additional drugs diminished, and many patients received only maintenance therapy with prednisone. The same degree of improvement as in the hospitalized group prevailed in the patients with acute and chronic asthma, except that in the chronic group the need for additional drugs remained more or less constant because of long-standing complications and sequelae. Twenty-nine of the 81 patients with acute asthma obtained complete relief, 49 had partial relief, and 3 were therapeutic failures. Fourteen of the 49 patients with chronic asthma were completely relieved, 31 partially relieved, and 4 were failures. The side-effects that were previously noted with corticotropin, cortisone, and hydrocortisone occurred to a greater or lesser degree with prednisone, but the dose required to produce these effects (more than 30 mg. per day) was proportionately larger and the length of time was much longer.

Prednisone is a very effective drug in bronchial asthma and shows marked anti-inflammatory action. It is about 4 to 5 times more effective, on a weight basis, than cortisone or hydrocortisone. Attention is called to the serious complications of adrenal insufficiency after stress phenomena and to the value of long-acting corticotropin to correct or offset this complication. The use of antibiotics in selected patients in whom an infectious component was suspected increased the effectiveness of prednisone or corticotropin in these patients.

Sporadic Non-Endemic Goitrous Cretinism: Identification and Significance of Monoiodotyrosine and Diiodotyrosine in Serum and Urine. E. M. McGirr, J. H. Hutchison and W. E. Clement. Lancet **2**:906-908 (Nov. 3) 1956 [London].

McGirr and associates had previously described the results of radioactive iodine (I^{131}) studies in 13 patients with nonendemic goitrous cretinism, 8 of whom were members of a family group of itinerant tinkers. It was postulated that in them there was an intrinsic defect in the synthesis of the thyroid hormone. Study of the pedigree of the tinker family suggested that this defect was determined by the activity of a single autosomal recessive gene. Recently the authors had the opportunity to investigate 2 additional hypothyroid goitrous members of this tinker group. One of the 2 was a 4-week-old male infant, the other a 24-year-old woman. The results of I^{131} tests on these 2 patients confirmed that hypothyroidism may occur despite an enlarged thyroid gland that is able and eager to take up iodine, to link it to protein, and to release it into the circulation in an organic form. In addition, however, monoiodotyrosine and diiodotyrosine as well as thyroxin were identified in the serum

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The place of publication of the periodicals appears in brackets preceding each abstract.

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of 1 of the patients and the iodotyrosyl compounds in the urine of both. It is postulated that the thyroid enlargement and hypothyroidism are due to the loss of these hormone precursors from the thyroid gland. Their loss is more likely to be due to deficiency of the enzyme dehalogenase than to difficulty with the oxidative coupling of two molecules of diiodotyrosine. Whatever the enzyme defect in this family, it is genetically determined.

Permanent Atrial Paralysis. S. Rossi and C. Nasi. Minerva med. **47**:1038-1042 (Oct. 10) 1956 (In Italian) [Turin, Italy].

The authors report on a patient with permanent atrial paralysis. He was 60 years old and during 4 years of continuous observation presented a persistent cardiocirculatory decompensation. Bradycardia increased markedly during the 4 years. Roentgen examination showed an enlarged heart shadow and aortic sclerosis. Electrocardiograms showed a complete lack of function of the atrium and a regular nodal rhythm with a slowly decreasing frequency. Postmortem histological examination showed that the Keith-Flack node was destroyed and that numerous small infarcts were located along the atrial walls, the ventricles, and the septum; their presence had not been detected clinically. The authors believe that the paralysis was caused by sclerosis of the aorta and of the coronary arteries.

Treatment of Chronic Tuberculous Empyema with a Combination of ACTH and Antibiotics. G. Fusco, D. A. Alexanian and M. Tozzi. Gazz. med. ital. **115**:304-311 (Oct.) 1956 (In Italian) [Turin, Italy].

Thirteen patients with chronic tuberculous empyema were treated with a combination of corticotropin and antibiotics. Clinical and radiological examinations were made before and after the treatment. The treatment did not cause complications. Increase of body weight was steady in all patients; there was no edema. Glycemia remained improved in some patients, and the hemoglobin returned to normal values. The erythrocyte sedimentation rate declined in all patients. The total dose and the amount of each drug in the combination were individually determined according to the patient's condition. The treatment had no marked effect on the quantity or on the quality of the fluid secreted. The hormone could not fully exert its local antiphlogistic or other beneficial effects because empyema was very severe in all patients; tissue damage and bronchopleural fistulas were present. The marked effect of the treatment on the general condition and the improvement in the radiological findings made surgical intervention possible in some patients who could not have survived the shock of the operation before the treatment.

Experiments showed that cortisone and corticotropin (ACTH) may play an important role in the cellular processes of defense. The fibrosis around the lesions is often absent and the nodules are less well defined when the tissues of granulation are not so developed. These processes, which normally prevent the passage of Koch bacilli, may limit the diffusion of antibiotics. The absence of these reactions which results from hormone treatment allows the diffusion of antibiotics, and especially of isoniazid, so that a more direct effect on the tuberculous bacilli is obtained.

Prognosis of Peptic Ulcer in Young Patients. O. Römcke and E. Löken. Acta med. scandinav. **155**:373-375 (No. 5) 1956 (In English) [Stockholm].

Earlier investigators had demonstrated that the duration of ulcer symptoms prior to medical treatment was of decisive influence on the prognosis; when the duration was less than 5 years, 50% of the patients with gastric ulcer and 40% of those with duodenal ulcer were free of symptoms. This percentage fell to 25% in both groups when the duration was longer. Studies on the importance of the age of the patient in the prognosis of peptic ulcers had given inconclusive results. A survey is described on 211 peptic ulcer patients in the 15-to-25-years age group, 5 years after medical treatment had begun. It showed that only 28% of those with gastric ulcer and 14% of those with duodenal ulcer had recovered. These figures are in accordance with those stated by Quigstad and Römcke in their study of peptic ulcer patients in all age groups. Later 91 (43.1%) of the 211 patients were subjected to partial gastrectomy. Eighty-four of these 91 patients could be traced and questioned; 67 stated that they were cured, 8 that their condition was improved but that they still had some trouble, 3 that there had been no change, and 1 that a secondary vagotomy had been successful. In 5 cases the operation had been so recent that the evaluation of the result was impossible.

Familial Occurrence of Disseminated Lupus Erythematosus. S. Glagov and E. Gechman. New England J. Med. **255**:936-940 (Nov. 15) 1956 [Boston].

Glagov and Gechman present the histories of a 44-year-old woman and her 18-year-old daughter. Both patients died, and, although permission for autopsy was not granted in the mother, the symptoms and course of the disease were sufficiently clear-cut for a diagnosis of disseminated lupus erythematosus. The mother exhibited weight loss, terminal hyperpyrexia, typical cutaneous lesions with butterfly pattern and photosensitivity, typical mucous-membrane lesions, arthralgias, generalized lymph-node enlargement, nausea and vomiting, terminal central-nervous-system lesions, positive skin and muscle biopsies, leukopenia, some reduction of thrombocytes, anemia, elevated serum globulin, and repeated demonstration of L.E. cells in the peripheral blood. The clinical course in the daughter was equally characteristic, and in addition she had ocular and renal findings and her clinical course was much more rapid. Of the 5 previously reported cases of familial occurrence of disseminated lupus erythematosus, only 3 are sufficiently well documented to be considered acceptable examples.

The etiology and pathogenesis of disseminated lupus erythematosus remain obscure. Infectious agents have been implicated, but no single infectious agent has been satisfactorily or repeatedly demonstrated, although considerable evidence has been accumulated

for an allergic hypersensitive mechanism. It has also been suggested that systemic lupus erythematosus is based on an antigen-antibody reaction, whereas discoid lupus is a cutaneous hypersensitivity reaction to an infective focus. Support for an antigen-antibody mechanism is found in the report of decreased serum complement in 27 patients with disseminated lupus erythematosus. The same phenomenon has been demonstrated in children with the disease. An important recent observation is that of Bridge and Foley, who describe the placental transfer of a serum factor related to L.E.-cell formation from a patient with disseminated lupus erythematosus to her newborn infant. In the cases presented, the mother was in the menopause at the time of onset of her symptoms, and there is no evidence that any clinical manifestations were present either before or during her pregnancies. The daughter, however, gave a history of long-standing photosensitivity and the appearance of a "V"-shaped rash under stress. If any link is to be established between the occasionally reported familial occurrence of the disease and the demonstrated placental transfer of the serum L.E. factor, studies of familial cases will have to be more numerous and include long-range observation of the offspring.

Chronic Cholangiolitic Hepatitis. M. C. F. Lindert. Am. J. Gastroenterol. **26**:547-554 (Nov.) 1956 [New York].

The intrahepatic disease, which has been designated by some (Watson and Hoffbauer in 1946) as cholangiolitic hepatitis, presents diagnostic and therapeutic difficulties. There is no general agreement about the term. Eppinger described a periacinar or cholangitic form of hepatitis; Watson and Hoffbauer suggested the designation of cholangiolitic hepatitis; others have adhered to the descriptive name of pericholangiolitis. Lindert applies the term chronic cholangiolitic hepatitis also to those cases in which biliary cirrhosis has developed, but he differentiates this type of "primary" biliary cirrhosis from those forms of biliary cirrhosis in which there is obstruction or inflammation of extrahepatic biliary ductal system. Cholangiolitic hepatitis has been known to develop in patients with sporadic or epidemic viral hepatitis. Others have suggested a hematogenous infectious involvement of the small biliary radicles supposedly as a form of descending cholangiolitis or cholangitis. Hepatotoxic agents have been known to produce a similar picture. Some of these hepatotoxins produced an intrahepatic biliary obstruction, while others produced jaundice by causing an increased permeability of the bile capillaries. Occasionally a combination of etiological factors may be involved, such as consumption of excessive amounts of alcohol and the existence of viral infection or other hepatotoxic agents. Chronic cholangiolitic hepatitis should be suspected in patients with prolonged, moderately severe jaundice, 2 to 4 months in duration, with or without severe pruritus. Hepatic enlargement with splenomegaly is a consistent finding. The stools are light in color (acholic) and the urine dark (bilirubinuria). Xanthomatosis is not a common feature. Laboratory studies are not diagnostic and may even erroneously indicate an extrahepatic biliary obstruction. The only conclusive diagnostic measure is surgical exploration, with investigation of the biliary ductal system by direct visualization and cholangiography.

Both physician and patient should realize that the disease is serious and protracted. The intrahepatic obstruction, per se, particularly when incomplete and not accompanied by infection, may be tolerated for a long time. The course becomes more rapidly progressive with increased obstruction, infection, and concomitant hepatocellular changes. Therapeutic measures should be directed to the liver and to the relief of distressing complaints and the general systemic complications. Complete bed rest is not beneficial, but a daily rest period and adequate rest at night seem helpful. The usual hepatic diet, high carbohydrate (350-500 gm.), moderate protein (100-120 gm.), and moderate fat (50-80 gm.), is generally utilized. Dietary supplements, such as lipotropic agent and vitamins, are given empirically. Calcium intake, by means of food or medication, is indicated in patients with steatorrhea or in those who have bone pain and osteoporosis or osteomalacia. The intermittent use of antibiotics appears to control the process or hasten healing. Continuous use of antibiotics may be hazardous. Stimulation of bile flow should be attempted by medical and surgical means. The author recommends prolonged drainage by T-tube and repeated irrigations of the T-tube and extrahepatic ducts. Simultaneous with this there may be instituted a biliary flush regimen, using atropine and magnesium sulfate, bile salts, or fatty feedings for cholagogue or choleretic effect. If anemia develops, iron therapy and vitamin B_{12} should be given a trial, but blood transfusions should be avoided. Gastrointestinal disturbances may be alleviated by bile salts, pancreatic extracts, vitamins, and calcium. Low-fat diets and special ointments assist in control of the xanthomatosis and psoriasis. Mildly antiseptic ointments and meticulous cleanliness control the secondary skin infections.

Multiple Serum Protein Deficiencies in Congenital and Acquired Agammaglobulinemia. D. Gitlin, W. H. Hitzig and C. A. Janeway. J. Clin. Invest. **35**:1199-1204 (Nov.) 1956 [New York].

The following three forms of agammaglobulinemia have been described: (1) a physiological or transient form occurring in infants; (2) a congenital form, inherited as a sex-linked recessive characteristic occurring in males; and (3) an acquired form, occurring in both sexes, with the onset of infections in adolescence or adulthood. The congenital and acquired forms of the disease are due to an absence of plasma cells with a consequent deficiency of gamma globulin and failure of antibody synthesis; the plasma cells appear to be the site of antibody synthesis. In the congenital and acquired forms of agammaglobulinemia the failure of gamma globulin synthesis seems to be permanent. Antigenic analysis was carried out on the serums from 8 children with congenital agammaglobulinemia, from 3 adults with the acquired disease, and from 6 normal children and adults. All of the serums studied were

obtained prior to institution of gamma globulin therapy. The results obtained indicate that at least 2 plasma proteins besides gamma globulin are absent or markedly diminished in congenital and acquired agammaglobulinemia. These proteins migrate as beta globulins and have no apparent antigenic relation to gamma globulin. Since the individual components of gamma globulin are immunochemically related and cross react with antiserums against gamma globulin, the data clearly indicate that these two beta globulins cannot be considered as fast-moving components of gamma globulin. The failure of synthesis of gamma globulin in these patients is presumably due to the absence of plasma cells; it is interesting to speculate whether these beta globulins are also products of the plasma cell. However, further study is necessary to establish the identity and function of these proteins. It would appear, from the intensity of the reaction and the position of the precipitation bands in the electrophoresis plates, that the concentration of at least one of these proteins is not very great even in normal plasma. This does not, of course, preclude its possible physiological importance. It must be emphasized that in agammaglobulinemia additional plasma proteins may be absent or deficient.

It had been demonstrated previously, using rabbit and horse antiserums against human gamma globulin in the quantitative precipitin reaction, that the failure of gamma globulin synthesis in patients with the congenital and acquired forms of agammaglobulinemia is not always complete. In this group of 11 patients the deficiency of gamma globulin was incomplete in 10, but in the eleventh patient no precipitation band for gamma globulin could be obtained even with the rabbit antiserum. The reasons for the apparently greater sensitivity of rabbit antiserum than horse antiserum in the detection of human gamma globulin lies in the precipitation characteristics of the two types of serums, the horse antiserum requiring a greater amount of gamma globulin for visible precipitation than does the rabbit antiserum under similar conditions.

The Cause of Hypercalcuria in Sarcoid and Its Treatment with Cortisone and Sodium Phytate. P. H. Henneman, E. F. Depsey, E. L. Carrol and F. Albright. J. Clin. Invest. **35**:1229-1242 (Nov.) 1956 [New York].

The cause of hypercalcemia and hypercalciuria in sarcoid is obscure. The authors report 4 complete balance studies on 3 patients with sarcoid. The studies revealed that the absorption of calcium from the intestine was increased, that there was hypercalcemia and hypercalciuria, and that the increased urinary calcium excretion was greater than could be accounted for by increased absorption alone. These changes strongly suggest that the hypercalciuria of sarcoid is due to endogenous hypervitaminosis D. If this is so, are these patients photosensitive in such a way that their skin forms excessive vitamin D on normal actinic exposure? Are they unable to inactivate vitamin D? The authors found that 2 of the 3 patients experienced recrudescence of hypercalcemia in the summer and that other investigators had noted that patients with sarcoid developed signs of vitamin D intoxication with much lower doses than did other persons. Attention is called to another action of vitamin D, namely the property of increasing intestinal absorption over a wide spectrum of substances. Thus, increased absorption of nitrogen, sodium, potassium, and magnesium was noted in 1 of these studies and in a patient with pseudohypoparathyroidism in whom hypercalcemia was produced by excessive doses of dehydrotachysterol, a congener of vitamin D.

Cortisone increased the fecal calcium and decreased the urinary calcium excretion of 2 patients. The mode of action of cortisone in this disease is not known. Sodium phytate also decreased urinary calcium excretion, apparently primarily by increasing fecal calcium excretion. Sodium phytate appears to be the treatment of choice of the hypercalciuria of sarcoid, and its use is suggested for other instances of increased calcium absorption such as vitamin D poisoning, idiopathic hypercalciuria, and idiopathic hypercalcemia of infants.

Studies of the Anemia and Iron Metabolism in Cancer. A. Miller, R. B. Chodos, C. P. Emerson and J. F. Ross. J. Clin. Invest. **35**:1248-1262 (Nov.) 1956 [New York].

Anemia in patients with malignant neoplastic disease is often associated with chronic blood loss and occasionally with chronic infection. However, in the majority of instances, the anemia cannot be ascribed to these causes. It has been interpreted by some investigators as a reflection of toxic bone marrow depression or destruction of the marrow by tumor metastases. It has also been suggested that the anemia of cancer may occasionally result from a diminution in the life span of the red blood cell. An increased rate of red blood cell destruction has been noticed in leukemia and lymphoma. Hypoferremia in cancer in the absence of chronic blood loss has been described by many investigators. To obtain more information about these different factors, studies were made on 38 cancer patients. Evidence of increased red blood cell destruction based on measurements of fecal urobilinogen excretion was found in 6 of 13 patients with malignant neoplasms. Increased red blood cell destruction was also found in 7 of 12 patients by red blood cell survival studies. The rate of red blood cell production, as measured by radioiron and red blood cell survival studies, was normal or increased in 29 patients in this series but usually failed to compensate for the increased hemolysis with anemia resulting. Thus, a "functional inadequacy" of erythropoiesis in the face of a red blood cell deficit may be considered the fundamental mechanism of anemia in neoplastic disease. Anemia was solely attributable to deficient red blood cell production in 9 patients, 4 of whom were totally or nearly free of marrow metastases. Hypoferremia associated with normal quantities of storage iron was a common finding in patients with cancer, the concentration of serum iron becoming progressively lower with dissemination of the tumor. Hypoferremia was usually, but not invariably, accompanied by anemia.

Prognosis in 80 Cases of Multiple Myeloma. A Videbaek and H. Johansen. Dan. med. bull. **3**:174-176 (Sept.) 1956. (In English) [Copenhagen].

The increasing frequency with which multiple myeloma is being found is due to improved diagnosis and growing interest in the disease. Of 80 patients with established multiple myeloma treated in the Radium Center or Medical Department A of the University Hospital, Copenhagen, from 1932 to 1955, only 10 were living after from 1 to 14 years. Half the patients under 60 at the onset of multiple myeloma died within 2½ years, while half of those over 60 at the onset died within 15 months. The prognosis seems to be about the same for patients with diffuse myelomatosis and those with multiple myeloma. Of five patients with solitary myeloma, 3 are living after 4¼, 4½, and 7 years, and 2 died after 6 months and 9 years.

Comparative Studies of Bone Marrow Punctures of the Sternum, the Iliac Crest, and the Spinous Process. T. Bennike, H. Gormsen and B. Møller. Acta med. scandinav. **155**:377-396 (No. 5) 1956 (In English) [Stockholm].

The authors subjected 121 patients (each during the same examination) to punctures of the sternum, iliac crest, and spinous processes. The aspiration yielded sufficient material to allow comparison of marrow specimens in 100 of the 121 patients. Differences in the marrow specimens from the distinct sites in the same person were looked for, but the marrow seemed to act as one (en bloc) organ. In only 13 patients were slight differences observed in the cellularity of sections from the three bones, but the differences were never of diagnostic significance. Thus, definite intraindividual variations were not demonstrable. Sternal puncture, as a diagnostic method, was superior to the other 2 procedures with regard to both technical ease and the quality of the marrow obtained. When cautiously and properly performed by one who is well trained and experienced in the method, sternal puncture hardly carries any greater risk than puncture of the iliac crest or the spinous process. These last 2 sites should be preferred for narrow puncture by inexperienced personnel who have received no practical instruction in the performance of sternal puncture.

Studies on the Site of Action of the Arylsulfonylureas in Man. A. E. Renold, A. I. Winegrad, E. R. Froesch and G. W. Thorn. Metabolism **5**:757-767 (Nov.) [Part 2], 1956 [New York].

Metabolic balance studies and comparative intravenous tolerance tests with glucose, fructose, and galactose were carried out before, during, and after therapy with the aminobenzene (carbutamide, BZ-55) and toluene (tolbutamide, Orinase) derivatives of arylsulfonylurea on the metabolic ward of the Peter Bent Brigham Hospital. Patients were selected for study on the basis of previous demonstration of responsiveness to the compounds. The authors had the opportunity to test the activity both of the aminobenzene and of the toluene derivatives in a patient with diabetes mellitus who had undergone hypophysectomy 2 months previously because of rapidly progressive diabetic retinopathy in the presence of good renal function. The completeness of the hypophysectomy was suggested by the development of hypothyroidism, by a markedly delayed response to corticotropin, and by a markedly decreased requirement for insulin; moreover, the insulin requirement could be restored to pretreatment levels by the administration of a growth hormone preparation. The patient was maintained on a constant diet and on hormonal replacement therapy consisting of 18 mg. of cortisone, 60 mg. of thyroid, and 12 units of NPH (modified protamine) insulin, daily.

The studies concerning the site of the hypoglycemic action of the arysulfonylureas indicate that these compounds do not exert their principal action by way of the pituitary, the thyroid, or the adrenals. Failure to demonstrate significant effects of these compounds on the rate of blood glucose removal after a glucose load, as well as failure to obtain appropriate changes in serum or urine phosphate, in blood lactate and pyruvate, or in the urinary excretion of nitrogen suggest that an "insulin-like" effect on peripheral glucose utilization is probably not a major component of the mode of action of the arylsulfonylureas. Decreased conversion of galactose or fructose to glucose during arylsulfonylurea action has been interpreted as suggesting decreased hepatic glucose release or synthesis. Although no demonstrable hepatic dysfunction results from the administration of these compounds, the evidence presented suggests that selective interference with hepatic gluconeogenesis might significantly contribute to their hypoglycemic action.

SURGERY

The Results of Surgical Treatment of Intracranial Aneurysms as Demonstrated by Progress Arteriography. L. A. Mount and J. M. Taveras. J. Neurosurg. **13**:618-626 (Nov.) 1956 [Springfield, Ill.].

Fifty-four progress arteriograms were performed in 51 patients with intracranial aneurysms who had been operated on. The angiograms were done postoperatively at an average time of 10 months, the longest being 7 years and 10 months. Thirty-five of the 51 patients had aneurysms of the internal carotid artery, 7 of the middle cerebral, 7 of the anterior communicating, and 1 each of the anterior cerebral and of the posterior cerebral artery. Ligation of the internal carotid artery in the neck was performed in 30 patients and ligation of the common carotid artery in 11. Thirteen patients had intracranial surgical therapy for the aneurysm. Some of the patients had more than one surgical procedure when the first operation was found to be ineffective, and progress arteriography was done after each procedure.

There were no complications as a result of the progress arteriogram, except in 1 patient who had a temporary paresis of one upper extremity. The number of patients reported on is not sufficient to draw any statistical conclusions, but certain inferences can be

made. The results of direct intracranial surgical attack on the aneurysm, as shown arteriographically, were better than those of any form of ligation of the carotid arteries. Arteriographically the results of complete and permanent ligation of the internal or common carotid artery were better than those of partial or temporary ligation, and, of the 2, ligation of the internal carotid artery proved to be superior. Ligation of the carotid arteries in the neck, using a tantalum clip, may not be a complete and permanent ligation.

Intracranial aneurysms were shown arteriographically in a control group of 16 patients who were not operated on and who subsequently had a second arteriogram taken. The time between the first and second arteriogram ranged between 2 weeks and 15 months. The progress arteriograms showed the aneurysm in all patients; it was of the same size in 13, and it was larger in 3.

Benign Tumors of the Foramen Magnum: Surgical Considerations. H. W. Dodge Jr., J. G. Love and C. M. Gottlieb. J. Neurosurg. 13:603-617 (Nov.) 1956 [Springfield, Ill.].

Benign extramedullary tumors, arising at the level of the foramen magnum, were observed in 19 women and 11 men between the ages of 19 and 69 who were admitted to the Mayo Clinic between 1924 and 1956. Twenty-six of these tumors were meningiomas and 4 were neurofibromas. An initial erroneous diagnosis of degenerative disease of the nervous system was made frequently because of the capricious nature of the unfolding symptoms of these tumors. Fourteen patients gave cervical pain as the initial complaint and 6 gave suboccipital headache. Five patients said that one or the other of these symptoms had been present at some time. A feeling of weakness in an extremity was the next common initial complaint. Paresthesia and muscle weakness were present at some time in 26 patients. Although the severity of the symptoms described by the patients usually progressed steadily, transient symptomatic improvement occasionally occurred after contrast baths or vitamin therapy. Evidence of involvement of the cranial nerves, and particularly of the 11th cranial nerve, was observed in 15 patients. Disassociation occurred between the three sensory modalities in 11 patients. All modalities of sensation were disturbed on the entire body below the neck in 6 patients. Only 3 of the 30 patients had entirely normal muscle power. Hyperactive reflexes were observed in all but 3 patients. About half of the patients had horizontal nystagmus. Choking of the optic disk was associated with the benign lesions in only 3 patients (10%) in contrast to the high incidence of such choking in patients with mixed tumors. There were few roentgenologic changes, and the most outstanding roentgenologic finding was that of enlargment of the intervertebral foramen between the 1st and 2nd cervical vertebrae. Five of the 20 patients who underwent spinal puncture had complete blocking of the subarachnoid pathways of the spinal fluid and 6 others had partial blocking. The values for protein in the spinal fluid ranged from 55 mg. to 2,400 mg. per 100 cc. The lowest and the highest values were obtained in the presence of a neurofibroma. Electroencephalograms proved of little value as a diagnostic aid, but electromyographic studies may be a valuable method of more precise localization by dermatometric means.

Twenty-seven patients were operated on and 3 were not. There were 2 operative deaths, and 4 patients were lost to follow-up. Two patients died within 4 months after the operation. Four patients who were neurologically well died of other causes within 2 to 19 years after the operation. Twelve are alive and well, and 3 are alive but have a neurological deficit. A striking immediate result was the rapid and often unexpected neurological improvement in many patients once the benign extramedullary compressive lesion had been removed. Respiratory problems were frequent. Preoperative tracheotomy may be essential for the maintenance of an adequate airway and for better evacuation of secretions both during and after operation. Occasionally, artificial respiration had to be resorted to shortly after the beginning of the operation, and respiratory function was regained only when the dura mater over the foramen magnum was opened.

Clinical suspicion is hardly enough in dealing with the diagnostic dilemmas presented by benign extramedullary neoplasms affecting the upper cervical portion of the spinal cord and the medulla in the foramen magnum. To establish the correct diagnosis, the physician must be not only possessed with a high index of tumor suspicion but also fortified with considerable surgical diagnostic endeavor. The end-results justify the unusual mental and physical effort required to handle these patients successfully and amply reward the patient and the surgeon.

Mitral Valvotomy for Mitral Stenosis: An Analysis of 104 Cases from this Viewpoint. G. V. Hall and H. M. Windsor. M. J. Australia 2:558-567 (Oct. 13) 1956 [Sydney].

Fifty-five of 104 patients with mitral stenosis were selected for operation and underwent mitral valvulotomy at 3 hospitals in Sidney, Australia. Three of the surgical patients were in their fifties, 11 in their forties, 34 were between the ages of 25 and 39, and 7 were aged less than 25 years, the youngest being 11 years old. It is preferable to delay the operation until the patient is older, but the rapid progress of the disease and attacks of pulmonary edema prompted early surgical intervention in the 7 young patients. Seventy-three of the 104 patients were women and 31 were men; 26 patients were rejected for surgical treatment because of mitral incompetence, and of these 13 were men and 13 were women, confirming the fact that the incidence of mitral incompetence as the predominant lesion is nearly equal in both sexes. Nineteen of 45 patients with a history of rheumatic fever were in the surgical group and 26 were in the medical group.

The predominant symptom was dyspnea. The patients were classified with regard to its severity according to Wood's set of grades. Grade 1 patients were able to lead normal lives, while grade 2 patients were unable to run or hurry and found walking up hill diffi-

cult. They were subdivided into grades 2a and 2b, according to whether the symptoms were progressive or not. Grade 3 patients could walk only a few hundred yards and had paroxysmal dyspnea or frank pulmonary edema. Patients totally or almost totally incapacitated were placed in grade 4, including all those with congestive cardiac failure. Twenty-two of the patients selected for mitral valvulotomy were in grade 2b, 29 were in grade 3, and 4 were in grade 4. Acute pulmonary edema was considered an urgent indication for valvulotomy. The key to final selection for operation lies in the correct interpretation of physical signs, and a patient is considered ideal for operation who shows signs of low cardiac output, a pulse nearly always of low amplitude, a tapping apex beat (not displaced), and diagnostic heart sounds. Thirty-seven of the surgical patients had a palpable diastolic thrill at the mitral area. A right ventricular lift just to the left of the sternum is of special significance, as it often indicates a severe degree of mitral stenosis with pulmonary hypertension. Well-developed mitral incompetence, aortic incompetence, tricuspid incompetence, and evidence of recent rheumatism are contraindications to valvulotomy. A widened P wave that was slurred, or flat-topped (P-mitrale) was present in 32 of the surgical patients and is a valuable sign of predominant mitral stenosis. Left ventricular hypertrophy was absent in all patients operated on. If present, it is a contraindication to operation.

Results were excellent in 22 patients, good in 16, fair in 3, and poor in 9. None of the patients died. Valvulotomy has a definite place in childhood. Valvulotomy should be performed in women with paroxysmal dyspnea, pulmonary edema, and hemoptysis early in pregnancy, provided that they do not respond to rest and administration of digitalis. Full digitalis therapy is considered essential for preoperative treatment of patients with mitral stenosis. The postoperative treatment, including the management of heart failure, arrhythmias, and the postcommissurotomy syndrome, is equally important.

Coarctation of the Aorta and Its Operative Treatment: A Study with Pre- and Postoperative Examinations. O. Peräsalo and J. Hakkila. Ann. chir. et gynaec. Fenniae **45**:207-217 (No. 3) 1956 (In English) [Helsinki].

Ten male and 5 female patients between the ages of 6 and 38 years with coarctation of aorta were operated on in Helsinki between 1952 and 1955. Three patients had a patent ductus arteriosus in addition to the coarctation of the aorta. The diagnosis of coarctation was established preoperatively in 11 patients, 3 of whom had the so-called infantile type of coarctation and 8 the adult type. The average blood pressure values before the operation were 192/109 mm. Hg in the arms and 116/93 mm. Hg in the legs of the patients. Resection of the aortic coarctation could be performed in 11 patients. An end-to-end anastomosis of the aortic ends was performed in 9 patients, and a successful anastomosis between the subclavian artery and the end of the aorta was performed in 2.

Ten of the 11 patients made a successful recovery and were followed up for periods ranging from 6 months to 3 years. The average blood pressure values after the operation were 157/82 mm. Hg in the arms and 144/80 mm. Hg in the legs. A comparison of the blood pressure values obtained 2 weeks after the operation and in the later follow-up revealed only very slight changes. The cardiac volume was diminished somewhat. The clinical results were considered good in 8 patients and satisfactory in 2 with far-advanced aortic insufficiency. The average age of these patients was 17 years, and only 2 were over 20 years of age; 1 of these 2, a 22-year-old woman, had a normal delivery 3 years after the operation. The favorable effect of surgery on the patient with coarctation of the aorta is clearly apparent even in the reported relatively small series of patients. Three additional patients with coarctation of the aorta were operated on with good results since the paper was accepted for publication.

A Clinical Study of Pulmonary Embolism. G. D. DeLaughter Jr. and W. G. Anlyan. Surg. Gynec. & Obst. **103**:695-700 (Dec.) 1956 [Chicago].

During the past 6½ years the authors have seen in consultation all patients with venous thrombosis and pulmonary embolism on the surgical, gynecologic, and obstetric services of Duke Hospital, Durham, N. C. They report clinical observations on 60 patients with pulmonary embolism. Three of the emboli were fatal, 2 of them in the first episode. Thirty (50%) of the patients had emboli without any physical signs of peripheral venous thrombosis; it is assumed that these emboli arose from the pelvis. Of the 30 patients who had peripheral venous thrombosis (9 in the right, 11 in the left and 10 in both lower extremities) 20 had calf tenderness and 16 had leg pain, and Homan's sign was present in 12, leg swelling in 9, groin tenderness in 8, and pretibial vein dilation in 1. The diagnosis of pulmonary embolism is difficult and largely depends on the physician considering its possibility. If the patient presents with acute pleuritic pain, dyspnea, hemoptysis, and cough, the diagnosis can be made if it is brought to mind. Often, however, the patient does not present this clear picture. Most patients initially have symptoms referable to the chest, and they are referred to as either a pain, a catch, a tight feeling, a fulness, an inability to take a deep breath, or a shortness of breath. A few hours later the patient may or may not produce blood-streaked sputum. These symptoms may be confused easily with myocardial infarction, agina, gallbladder disease, indigestion, or pneumonia. Examination frequently reveals an elevated pulse rate and localized rales. Roentgenograms may be helpful, but are seldom conclusive. Electrocardiograms have been useful in ruling out myocardial infarction.

As soon as signs or symptoms suggest venous thrombosis or pulmonary embolism the patient should be treated with anticoagulant drugs, but clotting and prothrombin time should be ascertained prior to such treatment. Five patients had a pulmonary embolus while they were receiving anticoagulant therapy. Observations on these 5 patients caused the authors to modify their plan of treatment. They now rely on heparin in the early course of thromboembolism rather than on the coumarins. They also learned that pulmo-

nary embolism after prostatic surgery should be treated by inferior vena cava ligation if bleeding recurs with heparin therapy.

Carcinoma in the Medial and Lateral Halves of the Breast. E. H. Pierce, J. W. Kirklin, J. R. McDonald and R. P. Gage. Surg. Gynec. & Obst. 103:759-764 (Dec.) 1956 [Chicago].

Case histories of 650 patients recorded as having been treated surgically for carcinoma of the breast at the Mayo Clinic in 1947 and 1948 were reviewed. Four hundred sixteen cases in which carcinoma of the breast presented itself as a palpable mass for which radical mastectomy was done constitute the basis of this study. There were 414 female and 2 male patients. The average age for the total group was 52.9 years. The right breast was involved in 221 patients and the left breast in 195. Three hundred sixty-four of the lesions proved to be adenocarcinoma, 41 were comedocarcinoma, 10 were Paget's disease, and there was a single liposarcoma. In order to localize the tumor into the various quadrants of the breast, the gross specimens removed at the time of operation and preserved in 10% formalin were examined. The upper outer quadrant was the most frequently involved site (43.3%). The medial half of the breast was the location of 30.3% of the carcinomas, 61.5% were located in the lateral half of the breast, and the remaining 8.2% were central in location. The 5-year survival rate for the entire group was 61%; for lesions of the medial half, 58.7%; for lesions of the lateral half, 62.9%; and for the central lesions, 54.5%. Patients who had lesions located in the medial half of the breast with axillary metastasis had a 5-year survival rate of 45.6%. Without axillary metastasis, the 5-year survival rate was 69.6%. Patients who had lesions located in the lateral half of the breast with axillary metastasis had a 5-year survival rate of 42.1%. Without axillary metastasis, the 5-year survival was 82.3%. There was a 5-year survival rate of 58.9% in the group of 234 patients whose lesion was not localized to a single quadrant but who nevertheless were treated by radical mastectomy.

Surgical Treatment of Gastric Carcinoma and Its Results. A. Kummer. Chirurg 27:481-486 (Nov.) 1956 (In German) [Berlin].

Kummer states that a palpable tumor is not necessarily inoperable, nor a nonpalpable tumor operable. There is no general agreement as to the meaning of the term "radical" in operations on the stomach. Some use the term as synonymous with total resection or gastrectomy, but the author insists that the term radical should imply complete removal of the tumor and of the corresponding lymph nodes. A subtotal resection may be a radical operation, if the distal or proximal stump of the stomach is free from tumor tissue, but "radical" implies the removal of the paracardial and suprapancreatic lymph nodes. It is impossible to estimate the extension of the tumor in the wall of the stomach. The surgeon may be under the impression that he made the resection far into the healthy tissue, but microscopic examination of sections may reveal that the carcinoma has advanced beyond the resected part in the submucous tissue. Neither pylorus nor cardia present a barrier against further extension of a gastric carcinoma. Transthoracic resection is preferable to the abdominal approach.

The author analyses the results obtained in 199 patients with carcinoma of the stomach during the last 2 years. The group included 147 men and 52 women. In all patients in whom a radical operation was no longer possible a palliative operation provided relief for a variable period and prolonged the life of the patient, and it did not increase the surgical mortality. There is a great difference in the primary mortality between total resection and the radical partial resection, the relative percentages being 34% and 8%. The author prefers the radical partial resection, particularly in patients with carcinoma in the region of the antrum. Total gastric resection is performed only when very special indications exist, such as submucous spread of the carcinoma in the direction of the cardia and extensive metastases in the lymph nodes. Radical total resection is justified in carcinoma of the corpus and of the cardia of the stomach. Here there is only a choice between "everything or nothing." The competence of the surgeon is of vital importance in these cases, for if the growth is operable in patients with carcinoma of the corpus or of the cardia, then total resection is the only promising treatment.

The Reduction of Postnephrectomy Hypertension by Renal Homotransplant. E. E. Muirehead, J. A. Stirman, W. Lesch and F. Jones. Surg. Gynec. & Obst. 103:673-686 (Dec.) 1956 [Chicago].

The development of hypertension in nephrectomized dogs sustained by dialysis led to attempts to evaluate the influence of renal homotransplants on the hypertension. Sixteen dogs were subjected to bilateral nephrectomy, dialysis, and a subsequent homogenous renal transplantation. The kidneys were removed posteriorly, the first under sodium pentobarbital and the second under ether anesthesia 5 to 7 days later. The renal transplantation, under ether anesthesia, was made by anastomosing the renal artery and vein and the proximal segments of the severed carotid artery and jugular vein respectively. The time of total renal ischemia varied between 20 and 40 minutes. The donor kidney was made ready under sodium pentobarbital anesthesia; upon separation its vasculature was flushed out with isotonic sodium chloride solution containing heparin. The tips of the renal artery and vein of the donor kidney were dipped in 40% formaldehyde for 1 minute before suturing. No compatibility tests between donor and recipient were made. After the arterial anastomosis, periodic spurts of the recipient's blood were allowed to traverse the donor's kidney. Within 5 to 20 minutes following completion of the anastomosis, urine flowed from the ureteral catheter. The over-all operative time varied between 1.5 and 2 hours. Following the procedure antibiotics were given, and 9 of the 16 dogs were given a blood transfusion. The blood was usually cross matched by means of the indirect Coombs test, using canine antiglobulin serum. The dietary formulas used consisted of a mix-

ture of dialyzed peanut oil, pure dextrose, electrolyte-free casein, and a vitamin supplement. Three different diets were used with varying amounts of fat, carbohydrate, and protein. Data obtained on the urine flow, the blood and urine urea concentrations, the specific gravity of the urine, the blood pressure, the weight, and the length of survival of the dogs are listed. Control experiments included two different procedures of autotransplantation and control sham operations.

The postnephrectomy hypertension of dogs was significantly lowered for a period of 4 to 5 days following the application of a homogenous renal transplant, but the reduction of the postnephrectomy hypertension apparently did not result from the loss of water and sodium from the animal. A preliminary sodium load was not necessary for the reduction of the blood pressure following the renal homotransplantation. Observations on autogenous renal transplants as well as certain studies on the homotransplants indicated evidence of renal injury mediated by the transplanting procedure. This injury was reflected by an excretory renal insufficiency, which, however, did not prevent the ameliorative influence of the renal homotransplant on the hypertension following nephrectomy. The renal homotransplant apparently was able to overcome the aggravating influence of dietary protein on the hypertension following nephrectomy. The transplanting operation per se was not responsible for the reduction of the hypertension, as indicated by failure of a sham operation to lower the blood pressure. The impression was gained that the renal homotransplant protected the vascular system against the injurious effects of nephrectomy. Renal homotransplants may be useful in elucidating which of the renal functions ameliorates the postnephrectomy hypertension. It appears that this function is nonexcretory.

NEUROLOGY & PSYCHIATRY

Heine-Medin's Disease: Considerations. R. H. Bolasell. Semana med. **63:** 697-709 (Oct. 4) 1956 (In Spanish) [Buenos Aires].

Observations were made on many patients with sequels of poliomyelitis. Poliomyelitis is a septic neuritis that causes an acute inflammation of the sympathetic lymph nodes, near the poliomyelitic foci in the spinal cord. The sympathetic disorder is the cause of ischemia in the involved segment of the spinal cord and the involved limb or limbs. The longer the duration of ischemia, the more irreversible the sequels. These can be prevented or modified by sympathetic ganglion blocking. The author found that in the course of poliomyelitis or its sequels oscillometry and sphygmonometry show diminished circulation in the involved limb, which slowly improved, up to complete or almost complete normalization by sympathetic ganglion blocking. The treatment is given in combination with surgery, when necessary. The sympathetic ganglion blocking, when used during the acute period of poliomyelitis, controls pain, prevents or favorably modifies muscular contracture, and favors rapid muscular recuperation. In chronic sequels in the legs, improvement of muscle function and of muscular electric excitability were secured from the treatment, provided lack of muscular excitability had lasted less than 9 years. The limbs regained normal temperature, shortening of the leg did not progress, and in some cases the leg grew 1 cm. (in comparison with previous shortening) during one year of treatment with novocaine sympathetic blocking every 2 weeks, after which the leg continued to grow at the same rate as the noninvolved leg.

Intraspinal Injections of Hydrocortisone. T. Lucherini and E. Cecchi. Minerva med. **47:**1013-1020 (Oct. 10) 1956 (In Italian) [Turin, Italy].

Intraspinal injections of hydrocortisone were given to 82 patients with radiculitis, spinal pain, or neuralgia. Moderate headache followed 28.65% of the injections; it was checked, however, in the course of 24 hours. Severe headache associated with vertigo followed in 9 cases; it was checked with caffeine or intravenous injections of distilled water. Fever, meningeal irritations, and inflammation in the spinal cord were not present. The ketosteroids were found unchanged in the urine of 8 patients who had received up to 350 mg. of the drug. Regression of all symptoms followed in 78.18% of 55 patients who suffered sciatic pains in the lumbar region; the injection had little effect in 5.45% of the patients and no effect in 16.36%. The effect of the treatment was still present after 3 months in 20% of the patients.

Arousing Effect of Megimide and Amiphenazole in Allypropymal Poisoning. J. Pedersen. Lancet **2:**965-(Nov. 10) 1956 [London].

Allypropymal (allyl-isopropylbarbituric acid) is widely used in Denmark as a hypnotic. More than half of all patients with poisoning by hypnotics that are admitted to hospital are due to allypropymal. It seemed that patients with this form of barbituric acid poisoning who were treated with megimide and amiphenazole did not regain consciousness ealier, in relation to the blood-level of barbituric acid, than patients who were not so treated and that these drugs did not hasten elimination of barbituric acid. To elucidate these points, 22 patients with allypropymal poisoning treated with these drugs (megimide alone in 9 and megimide plus amiphenazole in 13) were compared with 75 patients with allypropymal poisoning not so treated. Apart from the administration of megimide and amiphenazole, treatment was the same in the 2 groups. Deep coma and absent reflexes constituted the main indications for treatment with megimide and amiphenazole, which were administered by intravenous infusion. In almost all cases the immediate rousing effect was good; usually within 20 to 30 minutes the patients reacted to strong stimuli, and the reflexes reappeared and in many cases became hyperactive; but in most cases the patient lapsed into coma after the first infusion and a further infusion had to be given. The largest dose of megimide was 3,500 mg. and of megimide and amiphenazole together 7,000 mg. and 1,500 mg. Comparison with the 74 control patients

not treated with megimide and amiphenazole showed that these two substances did not curtail the period of unconsciousness or restore consciousness at higher blood levels of barbituric acid.

Effect of Megimide and Amiphenazole on Respiratory Paresis. C. Clemmesen. Lancet **2**:966-967 (Nov. 10) 1956 [London].

Seventy patients with serious barbituric acid poisoning were treated with megimide (β, β-methylethylglutarimide) or with amiphenazole (2, 4-diamino-5-phenylthiazole) in a Copenhagen hospital between September, 1955, and April, 1956. The drugs were administered in an intravenous drip, comprising 100 ml. of isotonic sodium chloride solution containing 500 mg. of megimide, to which was added 10 ml. containing 150 mg. of amiphenazole. The drip was administered together with the usual treatment at a rate of about 100 ml. in 30 minutes until 300 ml. megimide and 30 mg. amiphenazole had been administered; but it was interrupted when distinct reflexes were elicited, or in the event of muscular twitching, vomiting, or incipient convulsions. If, at the end of a few hours, the reflex activity was again diminished or remained diminished, infusion of the drugs was resumed. Total respiratory paralysis was hitherto regarded as an extremely serious complication of barbituric acid poisoning because analeptics were often ineffective and as a rule death ensued. Of 19 deaths from barbituric acid poisoning treated in the author's department in 1951, 5 followed total respiratory paralysis. The 70 patients with severe barbituric acid poisoning reviewed here included 7 with respiratory paralysis. Each of these 7 responded to brief treatment with megimide and amiphenazole. These 2 drugs are valuable adjuvants in the treatment of acute barbituric acid poisoning, if only for their effect on respiratory paralysis.

Delirious Psychosis and Convulsions Due to Megimide. J. Kjaer-Larsen. Lancet **2**:967-970 (Nov. 10) 1956 [London].

Psychosis developed in 15 of the first 50 patients with acute barbituric acid poisoning who were treated with megimide, and convulsions developed immediately after megimide administration in 16 of the 50 patients. Thirty-two of the patients received amiphenazole in addition to megimide. Psychosis appeared in 6 of the 18 patientes treated with megimide alone and in 9 of the 32 who also received amiphenazole. The psychoses did not differ between these 2 groups, and amiphenazole did not seem to contribute to their appearance. Visual hallucinations dominated the delirious psychosis. The frequency of psychosis was greatest after large doses of megimide; and in these cases the latent period between wakening and the onset of psychosis was briefest. Psychosis appeared in 9 of 12 patients who were barbiturate addicts. The 6 nonaddicts who became psychotic had been taking barbiturates in therapeutic doses; they had remained unconscious for a long time after administration of megimide. Convulsions occurred during treatment with megimide in half the barbiturate addicts and in half the patients who developed psychoses but in only a quarter of the nonaddicted patients who did not develop psychoses. The psychoses are apparently exogenous reactions provoked by megimide in barbituric-acid habitués. They resemble spontaneous withdrawal psychoses.

The Treatment of Myotonia. L. A. Liversedge and M. J. D. Newman. Brain **79**:395-413 (Sept.) 1956 [London].

Ten patients with dystrophia myotonica and one patient with myotonia congenita were treated with the following substances: cortisone, corticotropin desoxycorticosterone acetate, and procaine amide. A quantitative method was devised for measuring the power of the grip and the duration of the myotonia in the flexor digitorum sublimis. After some recordings had been made with concentric needle electrodes and on oscilloscopic electromyograph, it was discovered that the routine electroencephalographic apparatus could easily be adapted to provide an excellent myograph with use of surface electrodes. Cortisone and corticotropin reduced significantly the duration of myotonia in 8 out of 9 patients treated. In 3 of these cases the myotonia was virtually abolished. The muscle power was not affected. Desoxycorticosterone acetate and procaine amide in the dosage used were without demonstrable effect on either power or myotonia. Quinine appeared to be less effective than cortisone or corticotropin. Treatment with cortisone is indicated only in those cases in which myotonia is the predominant symptom. The effect may help to elucidate the mechanism of myotonia and other problems of muscle contraction.

PEDIATRICS

The Relationship of Paranatal Experience to Oxygen Saturation in Newborn Infants. M. M. Pennoyer, F. K. Graham, A. F. Hartmann and others. J. Pediat. **49**:685-698 (Dec.) 1956 [St. Louis].

The authors studied the effect of obstetric variables on oxygen saturation at birth and during the first hour of extrauterine life in 323 essentially unselected infants delivered vaginally. Two hundred seventy-six children were born in the St. Louis Maternity Hospital and 47 were born in the Homer G. Phillips Hospital for Negroes. The cases of 244 infants were uncomplicated; they had a negative prenatal history and low forceps or spontaneous delivery. Twenty-five infants had fetal complications including difficulties of labor, but the delivery itself was normal. Fifty-four infants had abnormal or operative deliveries whether or not prenatal complications were also present. Four samples of blood were taken from each infant, 1 from the cord at birth and the 3 subsequent specimens from the heated heel at 10, 30, and 60 minutes after birth.

The mean oxygen saturation of cord blood was 61% in the 244 infants whose cases were uncomplicated. Individual values varied widely between values as low as 10 to 19% in a few infants and 90% or more in

7 infants (3%) who were already normally oxygenated. Low cord values did not preclude subsequent normal oxygenation. The mean values for the infants whose cases were uncomplicated were 81, 90, and 94%, respectively, at 10, 30, and 60 minutes. The percentage of infants who achieved the normal neonatal level of oxygen saturation increased rapidly from 31% at 10 minutes to 79% at 1 hour. Sixty-eight of the 244 infants were delivered with the aid of regional anesthesia (pudendal block only) or without anesthesia, 35 with the aid of continuous caudal anesthesia, and 141 with the aid of inhalation anesthesia; the 68 infants showed oxygen saturation levels in the cord and in the 10-minute samples superior to those in the two other groups. These differences were significant at the 0.01 probability level. Cord oxygen levels obtained in those of the 244 infants who were delivered with the aid of light analgesia were superior to cord oxygen levels obtained in infants who were delivered with the aid of moderate analgesia. The difference, however, did not reach statistical significance.

The cord or subsequent blood oxygen saturation levels did not reflect the prenatal complications that had occurred alone in the group of 25 infants; the mean cord value for these infants was 61%, i.e., the same as that of the uncomplicated group. The mean cord value dropped to 54% (a significant difference) in the 54 infants with abnormal or operative deliveries with or without prenatal abnormalities. When the criterion of normal oxygenation by 1 hour was used, 21% of the uncomplicated group failed to achieve this level, whereas 29% of the prenatally-complicated group and 37% of the group with complicated deliveries remained below the normal 90% level at one hour. When the criterion of satisfactory clinical condition at birth was employed, 4% of the uncomplicated group required oxygen resuscitation and only 10% were in otherwise unsatisfactory condition at birth, a total of 14%. Fifty-six per cent of the prenatally-complicated group and 39% of the delivery-complicated group were thus affected.

Twenty-five infants requiring oxygen resuscitation were not included in the previous oxygen analyses except for the cord specimen. Even with the administration of oxygen, they showed inferior oxygenation throughout the first hour, and 11 (43%) were still below the normal 90% level at the end of the hour.

Celiac Disease: J. H. Ebbs. Canad. M. A. J. **75**:885-893 (Dec. 1) 1956 [Toronto].

Ebbs reviews the present status of knowledge on celiac disease, which is a chronic disturbance of nutrition resulting in poor absorption of fats and other nutrients. The feces vary from constipation to diarrhea. The large abdomen gives the child the well-known clinical appearance. Roentgenography of the intestine shows segmentation of the barium column, probably caused by an excessive secretion of mucus. Growth may be retarded, and hippocratic fingers may be seen in children with the severe form of celiac disease, but this sign disappears when the disease is cured. The dentition is often delayed, but the teeth usually remain quite good and free from caries. The onset is sudden in about half the cases, coinciding with an infection such as dysentery or nasopharyngitis; in the other 50% it is insidious. Occasionally, food allergy has been reported to be associated with the onset. The sugar tolerance curve is low if the sugar is administered by mouth, normal if given intravenously. The feces contain an average of 10 gm. of fat daily, whereas the stool of a normal child contains 4 or 5 gm. A study of the families of children with celiac disease showed that there is a family tendency. The discovery that the gluten of cereal, particularly wheat, is deleterious in some cases has provided one of the greatest advances in the management of this condition. The possible role of food allergy has been tested. While clinical trial would appear to support this as an etiological factor, skin tests with protein do not appear to be of value. Clinical experience with gluten-free diets, control of infection, the use of special starch recipes, and in severe and resistant cases the judicious use of cortisone, indicates that significant advances have been made in the management of celiac disease.

Polyostotic Fibrous Dysplasia (with Precocious Puberty and Pigmentation). M. G. Peterman. J. Pediat. **49**:719-727 (Dec.) 1956 [St. Louis].

Peterman reports a case of isosexual precocious puberty in a 7-year-old girl who has been followed and studied for 6½ years. The patient fulfilled the typical requirements for polyostotic fibrous dysplasia as elaborated by Albright. The onset of the disease with breast enlargement occurred at 1 month of age, the earliest onset of any of the known cases reported. The bloody vaginal discharge began at 5 months of age. At the same time pigmented spots were noted on the back of the right chest, the right shoulder, and on the right arm and forearm. There was a pigmented areola around the nipples, a slight hypertrophy of both breasts, and a slight development of fine pubic hair. The estrogen determination was normal. The irregular menstruation continued until the date of publication of the author's report. Cystic ovaries were found on abdominal exploration at the age of 14 months and again at the age of 7 years. Luteal and follicular cysts were removed. The vaginal smear showed luteinization. Roentgenograms of the wrists showed a bone-age of 13 years. Roentgenograms of the humeri showed irregular trabecular pattern in the middle portion. The base of the skull showed an increased bone density. There was precocious development of the ossification centers.

Cervical Lymphadenitis in Children Caused by Chromogenic Mycobacteria. F. H. Prissick and A. M. Masson. Canad. M. A. J. **75**:798-803 (Nov. 15) 1956 [Toronto].

Ten strains of chromogenic acid-fast and alcohol-fast rods were obtained in pure culture from pus aspirated from suppurating facial, submaxillary, or cervical lymph nodes in children between the ages of 1½ and 7 years in whom the clinical aspect suggested a tuberculous infection. All had closed lesions. Lymph nodes that were excised were declared to be histologically compatible with tuberculosis, although some

differences were noted. The clinical course in these 10 patients was benign, and healing occurred slowly without sinus formation. Two similar strains were isolated from empyema in 2 adult male patients and 2 additional strains were isolated from a bronchial aspiration fluid and from tissue of a tuberculous knee joint in children. These 4 strains could not be correlated with the clinical picture of the patients from whom they were obtained, and tests for their pathogenicity were not conclusive.

All 14 strains consisted of strongly acid and alcohol-fast, nonbranching rods, and produced markedly pigmented colonies, their color passing from bright yellow to deep orange. All grew best on mediums used for isolation of Mycobacterium tuberculosis, although good growth was also obtained on a wide variety of other mediums; 11 of the 14 strains utilized paraffin as a sole source of carbon. The strains isolated from the 10 children with subacute lymph node infections differed in pathogenic behavior from Myco. tuberculosis in not causing progressive disease and by their lack of tendency to produce ulcerative lesions in patients and in experimental animals. Allergic responses were obtained in guinea pigs and hens inoculated with tuberculin-like extracts of the strains, but the response of all inoculated animals to human or avian tuberculin was poor or absent. These findings suggest that the 10 strains belong to a different species of Mycobacterium and must be considered as the actual cause of the lymphadenitis in the children from which they were isolated. The name Mycobacterium scrofulaceum has been proposed.

DERMATOLOGY

Problems of the Skin Associated with Aging. M. Waisman. J. Florida M. A. 43:452-463 (Nov.) 1956 [Jacksonville].

The characteristics of the aging skin are reviewed. A variety of pigmented and hypertrophic lesions are prominent among the skin changes associated with aging. Most of them are benign, some have potentialities for changing into malignant growths, and others are malignant from the start. Recognition of their distinctive features will avert either unnecessary surgery or unwise neglect. Cerebral damage may at times initiate bizarre and puzzling cutaneous manifestations. The concept of autosensitization, whereby products of tissue destruction elaborated in a localized inflammatory lesion ignite an explosive allergic reaction of the skin, is suggested by the author as an explanation for persistent and eczematoid eruptions in aging persons. This phenomenon is usually provoked by overtreatment with topical medication. Nutritional inadequacy is synonymous with the faulty diet of many aged persons, but vitamin deficiencies are dermatological rarities. Dermatoses are often fallaciously interpreted as products of avitaminosis. Dermatitis of the corners of the mouth is a common abnormality of elderly people. Often incorrectly attributed to "vitamin deficiency," the eruption actually represents an infection that depends upon anatomic changes in the region of the labial commissures, such as exaggerated laxity and infolding of the tissues. Predisposing causes are loss of teeth, diminished elasticity of the skin, and abnormalities of occlusion.

The frequent occurrence of pruritus in the senile skin derives from the anatomic and biochemical changes of aging. Itching can often be attributed to the effect of excessive dryness, which is an accompaniment of the wasting of epidermal structures and which results in diminished oiliness and in dehydration of the surface. Contact with woolen garments compounds the irritation, as the fibrils of wool prick the skin. To this may be added the irritative action of soap and detergent retained in laundered clothing and bed linen as a result of insufficient rinsing. When an elderly patient complains of generalized itching and shows no objective changes to account for his discomfort, diseases of the liver and kidneys, diabetes, lymphomas, neoplasms, cerebral arteriosclerosis, psychiatric disorders, and the untoward effect of drugs must be considered. Providing relief for the victim of generalized itching, when the primary disease is incurable, is a difficult problem. In cases of pruritus of hepatic origin, methyltestosterone has been recommended; or ergotamine tartrate may be given subcutaneously, provided signs of peripheral vascular spasm are watched for. When pruritus accompanies a systemic or neoplastic disease, procaine given intravenously may provide temporary relief, or procaine amide (Pronestyl) hydrochloride may serve as well by mouth. Intravenous injections of calcium or strontium bromide are at times effective. Aspirin, Fowler's solution, antihistamines, or chlorpromazine may help. Clinical features and treatment of common vulvar lesions—kraurosis, leukoplakia, and neurodermatitis—are outlined. Oral leukoplakia is frequent and has a propensity for cancerous transformation. Attention is called to the problem of varicose veins among the aged and to the ease with which an autosensitization eruption may emanate from a focus of stasis dermatitis. Ischemic changes caused by obliterative arterial disease prompt an exhortation for careful attention to hygiene of the feet.

Diabetes and Psoriasis. S. H. Gibson and H. O. Perry. A. M. A. Arch. Dermat. 74:487-488 (Nov.) 1956 [Chicago].

The authors studied the histories of 29 consecutive patients admitted to the Mayo Clinic for treatment of psoriasis. Careful note was made as to whether psoriasis or diabetes occurred in grandparents, parents, uncles, aunts, brothers, sisters, and children. Weights were recorded on admission, and these were compared with the patient's average or ideal weights. Twenty-seven patients admitted for the treatment of dermatoses other than psoriasis served as controls. The studies revealed that there is no appreciably greater incidence of diabetes in families of patients with psoriasis than prevails in families of patients with other dermatoses. Patients with psoriasis are no more, and perhaps less, prone to be overweight than patients with other dermatoses. A genetic analysis of

these patients is not indicated, inasmuch as there appears to be no appreciably greater incidence of diabetes in families of psoriatics than prevails in families of the controls. Only slightly more than half of the patients with psoriasis could give definite information as to whether either psoriasis or diabetes has occurred in more than three generations of their families. The authors see no reason to presume that psoriasis and diabetes are related.

THERAPEUTICS

Dextran Sulphate: Use as an Anticoagulant, and Action in Lowering Serum Cholesterol. H. Cohen and G. R. Tudhope. Brit. M. J. 2:1023-1026 (Nov. 3) 1956 [London].

A single intravenous injection of 7,500 units of dextran sulfate was given to each of 6 volunteers, and the clotting time was measured during the following 8 hours. The clotting time was prolonged to more than twice the initial level for from 4 to 6 hours. Repeated intravenous injections of dextran sulfate were given to 11 patients: 7 with acute myocardial infarction, 3 with persistent anginal pain after a previous myocardial infarction, and 1 with thrombosis of the inferior vena cava. The dose of dextran sulfate was kept constant at 5,000 units, and the frequency of the dose was varied in accordance with the clotting time, which was measured at intervals during each day. The clotting time could be maintained at more than twice the normal by 3 8-hourly injections of the drug, with a total dose of 15,000 units in the first 24 hours, by 2 injections every 12 hours (10,000 units daily) for the next 4 to 10 days, and thereafter by 1 daily injection of 5,000 units.

There was at first a profound drop in the serum cholesterol level during treatment with dextran sulfate. This reduction in the serum cholesterol level persisted only with a daily dose of from 10,000 to 15,000 units of dextran sulfate. The serum cholesterol rose to its original level when the dosage was reduced from 10,000 to 5,000 units daily. A mild degree of alopecia was observed in 3 patients, occurring after 14 to 21 days of continuous treatment. Two additional patients had diarrhea with the passage of blood in the stools after 14 days of treatment.

Dextran sulfate is an effective anticoagulant for clinical use and provides a possible alternative to the usual combination of heparin with an anticoagulant given orally. Toxic effects may occur, particularly if the dose is not carefully controlled.

Chlorpromazine Therapy Complicated by Agranulocytosis and Jaundice. R. P. Jeub and L. J. Michienzi. Minnesota Med. 39:740-741 (Nov.) 1956 [St. Paul].

Chlorpromazine was used to control withdrawal symptoms from drug habituation in a 47-year-old man. He became jaundiced and developed agranulocytosis. While jaundice and agranulocytosis have been observed separately after treatment with chlorpromazine, the authors believe that this is the first time that they occurred concomitantly in the same patient without fatality. In this patient both complications disappeared without sequelae 25 days after cessation of chlorpromazine therapy. It is emphasized that, when jaundice develops in a patient receiving chlorpromazine, not only should the drug be withdrawn but the hemogram should be examined because of the possibility of agranulocytosis, the latter requiring both withdrawal of the chlorpromazine and administration of antibiotics.

PATHOLOGY

Pathogenesis of Cardiac Rupture Due to Myocardial Infarction: A Study of 26 Cases. J. H. Lunseth and M. Ruwaldt. Dis. Chest 30:499-507 (Nov.) 1956 [Chicago].

Twenty-six instances of myocardial infarction with cardiac rupture in 16 male and 10 female patients were observed among 6,791 autopsies performed at the Milwaukee County Hospital between 1942 and 1955. Nine hundred seventy of the 6,791 deaths had resulted from myocardial infarction. The average age of the patients at the time of death was 70.7 years. None of the patients had a history of previous myocardial infarction.

Microscopic findings showed that the age of the infarct at the time of rupture was less than 2 weeks in all, less than 1 week in 19, and less than 3 days in 10. Causative factors such as hypertension, overexertion, fatty infiltration, and granulocytic exudation were not found to be of particular significance in this group. Penetration of the myocardial wall by a dissecting hematoma was considered an important factor in cardiac rupture of a myocardial infarct. Such a hemotoma was found in 17 patients, and in 13 of these the blood penetrated the wall by infiltration in the loose interstitial tissue between intact myocardial fibers. In 4, the hematoma penetrated mainly through necrotic myocardial fibers. The source of the infiltrating hematoma could not be definitely determined. The finding of the largest collections of interstitial blood in the middle and outer thirds of the wall in 6 patients suggested that in these the hemorrhage began in the wall. The mechanism of cardiac rupture appears to be similar to that of a dissecting aneurysm of the aorta. Both conditions result in loss of support and alterations of the wall of small vessels, leading to hemorrhage and the formation of a dissecting mass of blood, propelled by the systemic blood pressure. Dissecting hemorrhage is one of the few considered causative factors that is rarely found in myocardial infarction without rupture.

Differential Characteristics in Vitro and in Vivo of Several Substrains of BCG: IV. Immunizing Effectiveness. R. J. Dubos and C. H. Pierce. Am. Rev. Tuberc. 74:699-717 (Nov.) 1956 [New York].

The antituberculous immunity elicited by BCG vaccination is the outcome of the antigenic response to bacillary material having 2 different origins, namely, the bacilli present in the vaccine preparation and the bacilli that multiply in vivo after injection. The relative importance of these 2 components of the immune response depends on the conditions of the test. Experiments carried out with various substrains of BCG in

animals have shown that if the dose of vaccine injected is very large, as is often the case in animal experimentation, it can provide outright and intense antigenic stimulus and elicit immunity even though the vaccinating bacilli do not have a chance to multiply in vivo. This is the case if the bacilli have been killed before the injection or if the animals receive isoniazid therapy during the course of vaccination. Under these circumstances, the immune response appears to be independent of the inherent characteristics of the BCG substrain used in the preparation of the vaccine.

The results are very different when the amount of vaccine injected is smaller—of the order (per body weight) of that used in human vaccination. With the doses of vaccine usually employed under practical circumstances, isoniazid chemoprophylaxis interferes with the development of immunity by inhibiting bacterial multiplication and hence preventing the accumulation in vivo of an amount of antigenic material sufficient for an adequate protective response. With small doses of vaccine, marked differences can be recognized in the immunizing effectiveness of the various substrains of BCG. The more efficiently the BCG organisms multiply in vivo, the more rapidly they elicit immunity in the vaccinated albino mice. The longer they persist in the tissues, the more lasting is the immunity to which they give rise. It can be presumed that the BCG substrains that are best able to multiply and survive in experimental animals are also the ones that are most prone to cause adenopathies or other abnormal manifestations. The choice of BCG substrain for human vaccination involves therefore a compromise between invasiveness (with related immunogenic effectiveness) of the vaccine and the risk of accidents that might result from its use in man.

RADIOLOGY

Correlation of Pain and the Roentgenographic Findings of Spondylosis of the Cervical and Lumbar Spine. A. E. Hussar and E. J. Guller. Am. J. M. Sc. 232:518-527 (Nov.) 1956 [Philadelphia].

Five hundred men between the ages of 18 and 65 years, employed with the Veterans Administration hospital of Montrose, N. Y., submitted on a voluntary basis to a clinical and roentgenographic examination. Thirty-eight of the 500 men complained of cervical pain and 84 showed roentgenographic signs of spondylotic changes such as bony spurs of the vertebral bodies, narrowing of disk spaces, narrowing of intervertebral foramens of the cervical and lumbar spine, and abnormalities of the apophysial joints. As a rule, pain was not associated with these roentgenographic changes. While the incidence of positive roentgenographic findings increased with age, body weight, and physical work, the incidence of pain did not. No correlation could be found between the severity of the roentgenographic findings and the incidence and severity of pain.

It is conceivable that pain may be produced by the encroachment of a bone spur, protruded disk, or narrowed foramen on a by-passing nerve trunk, thus producing the symptoms of radicular compression. This occurrence, however, is probably more an exceptional than a natural sequel of spondylosis. None of the 23 men whose roentgenograms showed bony spurs within the cervical intervetebral foramens had radicular symptoms, and only 2 complained of pain, localized at the back of the neck. None of the 17 men with narrowed disk space in the lumbar spine had radicular symptoms. Ten of the 13 men who complained of pain radiating into the lower extremities had negative roentgenographic findings, and the roentgenograms of only 3 showed spurs of the vertebral bodies. The roentgenograms of none of these 13 men showed narrowed disk spaces or narrowed intervertebral foramens. Routine roentgenograms are of doubtful value in the diagnosis of encroachment on the nerves by spondylotic changes. The common practice of labeling a patient with the diagnosis of "degenerative joint disease" (or "osteoarthritis," "hypertrophic arthritis") of the spine because of roentgenographic findings of spondylotic changes should be abandoned.

The Primary Treatment of Adenocarcinoma of the Rectum by High Voltage Roentgen Rays (1,000 K. V.). I. G. Williams and H. Horwitz. Am. J. Roentgenol. 76:919-928 (Nov.) 1956 [Springfield, Ill.].

Fifty-six women and 133 men of the average age of 60 years with adenocarcinoma of the rectum were treated primarily by roentgen rays at the St. Bartholomew's Hospital in London between 1937 and 1954. The 189 patients were classified into 4 groups according to the extent of the disease; 8 were in group 1, with lesions confined to the rectal mucosa but not penetrating the rectal wall; 26 were in group 2, with lesions involving the whole thickness of the rectal wall but not extending beyond these limits; 128 were in group 3, with lesions spread beyond the rectum to neighboring structures and/or involving regional lymph nodes in the pelvis; and 27 were in group 4, with carcinoma of the rectum and distant metastases. Thus 155 (82%) of the 189 patients were inoperable, and in the remaining 34 (18%) operative treatment was contraindicated for one reason or another. Radical treatment was almost always given, and a dose of 6,000 r to the whole of the tumor-bearing volume in 6 to 8 weeks was aimed at, although not always achieved. All patients were treated with roentgen rays generated at 1,000 kv. (half-value layer 9.3 mm. copper). With a 5 or 6 field crossfire technique using an anterior and posterior port with corresponding anterolateral and posterolateral ports, each of the order of 16 by 10 cm., it was possible to deliver a depth dose to the whole of the true pelvis of the order of from 120 to 140% of the skin field dose. Since roentgen rays generated in the 1,000-kv. range show no marked differential absorption in bone, a homogeneous heavy irradiation of all the pelvic tissues is thus achieved.

The greatest measure of success was achieved when bleeding was the presenting symptom, and in 121 (90%) of 135 patients bleeding was either completely arrested or relieved. When discharge of mucus was predominant, 77 (67%) of 116 patients obtained some measure of relief. For pain and tenesmus the percentages in whom relief was obtained lay between these 2

figures. Relief of symptoms paralleled clinical regression of the tumor mass. Colostomy was performed on 112 patients (59%), and 77 patients (41%) did not require colostomy. In 50% of the patients treatment had to be interrupted and modified because of radiation reaction, which comprised irritations of the bladder and intestine in most patients and to a lesser degree general malaise, nausea, and vomiting. These setbacks were generally simple to deal with and did not represent a serious hazard to the patient. More serious late complications consisted of rectovaginal fistula in 12 patients (6%), chronic irradiation necrosis in 9 (5%), and fibrosis with resulting stenosis of the rectum in 32 (17%). Fifty-five (33%) of the 165 patients treated between 1937 and 1949 survived 2 years, 23 (14%) survived 3 years, and 9 (5%) survived 5 years. Of the 9 patients who were alive at the end of the 5-year follow-up, 6 died at varying periods of from 5 to 10 years and 3 were alive at the end of 1954, having survived for 11, 12, and 16 years respectively. All these were patients classified into group 3. These data suggest that complete or partial relief from symptoms caused by primary growth may reasonably be expected from the irradiation treatment. There is a good chance of avoiding a colostomy, and a small but definite chance of "cure." The possibility of development of serious radiation effects has to be faced if worthwhile results are to be obtained in a large proportion of patients treated. The better therapeutic effect in adenocarcinoma of the rectum of the shorter wave-length roentgen rays compared with roentgen rays generated in the conventional medium voltage range is due to the increase in depth dose obtained and a greater facility with this technique for homogeneous irradiation of the pelvis. The result should therefore be equalled or bettered by the larger supervoltage units now in use and by large telecurie units.

Late Lesions in Man Caused by Colloidal Thorium Dioxide (Thorotrast): A New Case of Sarcoma of the Liver 22 Years After the Injection. J. de Silva Horta. A. M. A. Arch. Path. **62**:403-418 (Nov.) 1956 [Chicago].

It is widely recognized that thorotrast (colloidal thorium dioxide) may cause late morbid states such as Thorotrast granuloma, panmyelopathies, liver cirrhosis, and neoplasm. The case presented was that of a 46-year-old man who in October, 1954, complained of a dull, intermittent pain in the right hypochondrium, radiating to the lumbar region on the same side and to the epigastric region. The pain was not related to the ingestion of food but became sharper with respiratory movements. When he was seen at the hospital, 15 days after the onset of the symptoms, the abdomen was protruding, but there was no ascites. Abdominal examination revealed an elastic, painless mass that seemed to be in continuity with the liver. A plain x-ray of the abdomen revealed an opacity of the spleen and liver, suggesting that the patient had been injected with Thorotrast. The injection had been administered 22 years earlier. Three days before the patient's death, which occurred 20 days after the onset of the symptoms, the abdomen suddenly increased in volume, the pain became more severe, and the general condition became progressively worse. On the day of death the patient was transferred to the surgical department, but died before surgical intervention was possible. Autopsy revealed Thorotrast in spleen, liver, and in some of the lymph nodes of the liver hilus; angioblastic sarcoma of the left lobe of the liver; small tumor nodules in the right lobe; rupture of the tumor, with the formation of a subcapsular hematoma; hemoperitoneum; and anemia.

PHYSIOLOGY

A Comparison of the Composition of Sweat Induced by Dry Heat and by Wet Heat. E. F. St. John Lyburn. J. Physiol. **134**:207-215 (Oct.) 1956 [London].

Sweat contains most of the constituents found in the urine. The sweat glands may on some occasions play an important role as an excretory organ. Sweating has been used to relieve azotemia, although severe uremia was found unsuitable for such treatment. An apparatus is described whereby sweating under conditions of wet heat can be induced for considerable periods of time without rise in body temperature. The composition of sweat induced by dry heat and by wet heat has been compared with that of normal plasma in a large number of subjects. The inorganic constituents of sweat under both sets of conditions are less concentrated than in the plasma, with the exception of potassium. The organic constituents, with the exception of glucose and uric acid, are more concentrated. In a smaller number of subjects, direct comparison was made of the composition of blood and of wet-heat sweat: the results were essentially similar to those obtained by comparison with normal plasma. The main inorganic constituents of dry-heat sweat are from 3 to 3.5 times more concentrated than in wet-heat sweat, reflecting the partial evaporation from the secreted sweat under the former conditions and dilution with condensed steam under the latter. The remaining inorganic and all the organic constituents of dry-heat sweat are considerably less concentrated in relation to those of wet-heat sweat, indicating more active excretion under the latter conditions. The average blood clearance of urea by the sweat glands over a period of 20 minutes under wet-heat conditions equals that of 1 kidney.

The main difference induced in the body by the 2 sets of conditions is that of body-core temperature. During exposure to wet heat there is actually a fall due to the artificial cooling of head, neck, and inspired air, whereas during exposure to dry heat the body temperature rises in spite of partial evaporation of the sweat. Thus the stimulus to sweating in the latter case is, to some extent, from the temperature regulating center, whereas in wet heat the stimulus is entirely local, from the skin exposed to the heat. The mechanism whereby the difference is brought about is still obscure. From the practical point of view the fact that excretion of organic substances is more efficient when sweating is induced by wet heat is important, and in the author's experience many patients on the verge of renal failure can be and have been restored to relative health by periodic sweating of this nature.

BOOK REVIEWS

Anesthesia for Surgery of the Heart. By Kenneth K. Keown, M.D., F.A.C.A., Associate Professor of Anesthesiology, Hahnemann Medical College and Hospital, Philadelphia. Publication number 304, American Lecture Series, monograph in Bannerstone Division of American Lectures in Anesthesiology. Edited by John Adriani, M.D., Director, Department of Anesthesia, Charity Hospital, New Orleans. Cloth. $3.75. Pp. 109, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1956.

This timely book describes the pioneer experience of the author and his associates in providing anesthesia for operations on and in the heart. Anesthesia of this particular type is an important subject, since there is still a great lack of information generally on the best technique or techniques to use. The author has included data on catheterization concerning not only the normal heart but also the heart affected by such lesions as tetralogy of Fallot, pulmonary stenosis, and mitral stenosis. Some attention also is given to the mortality rates that accompany the various cardiac defects. The effects of posture on blood pressures are set forth, the management of anesthesia is described, and the precision necessary for good results is emphasized. It is no longer enough for the anesthesiologist to be familiar with the names of certain cardiac anomalies; he must thoroughly understand them. Appropriately, the importance of the electrocardiogram in the recognition of the various conditions that can develop is well explained.

There is a chapter on complications and another on postanesthetic management. Chapters are devoted to the tetralogy of Fallot, pulmonary stenosis, patent ductus arteriosus, coarctation of the aorta, atrial septal defects, mitral stenosis, aortic stenosis, mitral insufficiency, and aortic insufficiency. The author writes that anesthesia for intracardiac operations has passed the stage of trial and development, and he lists 10 criteria by which an ideal anesthetic agent can be recognized. The book contains an excellent bibliography, but it has no index. Perhaps a volume of 102 pages of text does not need one. The work is printed on good paper, in type that is easily read. It should be of value to all concerned with providing anesthesia for intracardiac operations. The need for such a book is shown in the fact that some men today are traveling halfway around the world to visit the few centers in which this particular kind of anesthesia can be seen and studied.

Five Hundred over Sixty: A Community Survey on Aging. By Bernard Kutner, David Fanshel, Alice M. Togo and Thomas S. Langner. Cloth. $4. Pp. 345. Russell Sage Foundation, 505 Park Ave., New York 22, 1956.

This book is a comprehensive report of an extensive investigation of 500 elderly persons living in an urban community. The group making this survey believed that the best way to find the answers was to ask older people personally and individually what their problems were. The study sought to answer three questions: 1. What social and cultural factors facilitate adjustment to aging? 2. What kinds of people successfully adjust themselves to aging? 3. What forms should be taken by programs designed to serve the needs of the aged? There are sections on patterns of adjustment that are concerned with marriage, employment, morale, and such important factors as motivation and isolation, with reference to the everyday life of these persons. A section is devoted to health, with investigation into the problem of the prevailing community health services and how well they were utilized by this group. Of particular interest are the observations in regard to the influence of income on the use of such facilities. Illness was found to be more common as one descended the economic ladder. The last chapter presents a critical analysis of the services available for the aged in the area surveyed.

The authors concluded that there is a real need for the community to adapt itself to the many factors investigated that may influence the use of the various services. Most people will go to a center even if it is called an "age center," and 39% would go to "a geriatrics center." Sixty-nine per cent of these persons lived at home, 94% in noninstitutional households. The need for providing care in the home is emphasized, and it is suggested that summer camps for children might be used for older people in the seasons when children are not in residence. There is a need for adult education with reference to the problems of aging. Repeatedly, it is emphasized that this is not a homogeneous population and that of necessity great care should be taken in providing for the needs of the older age group so that specialized services can be established for those who needed them the most. This volume should be of great interest to physicians, social workers, and welfare workers who are concerned with the problems of the aged and their possible solution.

Urology and Industry. By Leonard Paul Wershub, M.D., F.A.C.S., F.I.C.S., Associate Professor of Urology, New York Medical College, Metropolitan Medical Center, New York. Cloth. $5. Pp. 151. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, Canada, 1956.

Prevention of industrial injuries was first recommended by Ramazzini in 1700. Payroll deduction to finance benefits after accidents and death was first introduced in Germany in 1884. Legislation regulating working conditions had a slow beginning. In the United States at the beginning of the 20th century there was little social legislation and no compensation for occupational disability and there were no laws governing employer's liability and safe working conditions. Industrial medicine today represents the programs of the medical supervision, preventive medicine, and public health in industry. The fact that in-

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

dustrial workers and their families make up one-half of the nation's population indicates the importance of the industrial physician. Workmen's compensation laws include compensation for loss of earnings and free medical services and state that "there must be a causal relation between the injury and the employment." An industrial injury, however, need not occur at the place of work. The causal relationship between complaint and the accident must be medically established and evaluated. The average person is prone to blame any disorder on an accident. There is an excellent discussion on the difficulties encountered in establishing the causal relation of cancer, tuberculosis, and functional disorders or aggravation of them to alleged previous accidents and injuries. Helpful suggestions are made for establishing the authenticity and time interval of the sequelae of an accident.

The book contains 100 case reports, with comments on accidents and injuries to the human body and the genitourinary organs. The case reports are short and well presented. They are classified as injuries or late sequelae of injuries to the kidney, ureter, bladder, prostate, and scrotum. The knotty problem of injury and aggravation of disease is carefully evaluated. Many physicians and surgeons have little contact with industrial medicine. The industrial physician, general surgeon, urologist, and attorney can use this volume as a reference to help establish more clearly the causal relation of injuries and accidents or their aggravation as occurring in industry.

Clinical Pathology: Application and Interpretation. By Benjamin B. Wells, M.D., Ph.D., Director of Clinical Investigations, Lynn Clinic, Detroit. Second edition. Cloth. $8.50. Pp. 488, with 25 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1956.

This second edition was written, according to the author's statement in the preface, for medical students and physicians as a guide in the application and interpretation of laboratory studies. Dr. Wells accomplishes this objective very well. The first chapter describes the indications for laboratory procedures and their interpretation in infectious diseases. The next five chapters deal with the application and interpretation of laboratory procedures in diseases of the gastrointestinal system, respiratory system, cardiovascular system, kidney and urinary tract, and the blood. The next chapter deals with these procedures in metabolic and endocrine disorders, and there are chapters on clinical laboratory studies in surgery and in obstetrics. The last chapter describes the technique of some of the more commonly used laboratory procedures, and it includes a complete table of normal values. This book is not a laboratory manual, however, and little attention is paid to technique, especially in clinical chemistry, bacteriology, and serology. The text is easy to read because each section of each chapter has a heading in bold type and each of these sections has subheads. There are few illustrations, but their absence does not detract from the book, which is helpful as a reference in discussing the indications for laboratory procedures and their interpretation with members of the medical staff, the house staff, medical students, and medical technologists. It should, therefore, be of interest to all physicians.

Neurology of the Ocular Muscles. By David G. Cogan, M.D., Professor of Ophthalmology, Harvard Medical School, Boston. Second edition. Cloth. $8.50. Pp. 296, with 86 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, Canada, 1956.

The present edition of this unusual book contains so many important changes and additions to the text that it is in effect a new work. The description of recent advances in the recognition of anatomic and functional localization in the cerebellum bring to the reader a ready reference to the current accomplishments of investigators in the field of neuroanatomy. The clinical application of knowledge of the centers of the nervous system in diagnosis of disturbances of ocular motility that comes at the end of each chapter is an unusual feature. The author draws on his clinical experience for illustrative cases. In 10 chapters he covers the subject from gross anatomy to nystagmus and the external and internal ocular nervous mechanisms and discusses each section from the standpoint of clinical symptoms. The subject matter is presented in capsule form that is most useful for beginners in ophthalmology, clinical neurology, and general medicine.

Principles of Clinical Electrocardiography. By Mervin J. Goldman, M.D., Assistant Chief of Medical Service and Cardiologist, Oakland Veterans Administration Hospital, Oakland. Boards. $4.50. Pp. 310, with illustrations. Lange Medical Publications, P. O. Box 1215, Los Altos, Calif., 1956.

The method of presentation, the numerous clear diagrams and illustrations, and the avoidance of controversial material in this book indicate that the author has had wide experience in teaching electrocardiography. In general, the book follows the conventional pattern of an elementary textbook on electrocardiography, except that emphasis has been placed on the unipolar leads. The author has perhaps gone too far in presenting only one point of view throughout the book. For instance, many would question his statement that "basically there is no difference between atrial tachycardia and atrial flutter." References are meager (only four books and six articles). This is a good elementary textbook on electrocardiography for medical students, interns, and residents.

Clues in the Diagnosis and Treatment of Heart Disease. By Paul D. White, M.D. Publication number 295, American Lecture Series, monograph in Bannerstone Division of American Lectures in Circulation. Edited by Irvine H. Page, M.D., and A. C. Corcoran, M.D. Second edition. Cloth. $5.50. Pp. 190, with 40 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1956.

The first edition of this book met with such an enthusiastic reception that a new edition incorporating additional clues was inevitable. Although suggestions of a number of friends have been added, the author has not altered the original arrangement. In successive chapters clues from a carefully taken history, physical examination, roentgenology, electrocardiography, and therapy are discussed. The text is easy to read and supplemented by a few well-chosen illustrations. This book could be read with profit by all physicians.

QUERIES AND MINOR NOTES

POLIOMYELITIS AT 56 YEARS OF AGE

To the Editor:—*A 56-year-old man experienced a severe headache one evening. The next morning he went to work, but that afternoon he had a headache; neck, back, and hip pains; and a sore throat associated with chills and a slight nasal discharge. The next morning he had the same symptoms and a temperature of 102 F (39 C). When he walked he was found to limp. The next morning he was found to have complete paralysis of the lower extremities, and he had been unable to void since the afternoon before. A diagnosis of poliomyelitis was made, but the history showed that, since 1954, the blood pressure had ranged from 160/110 to 125/94 to 230/150 mm. Hg. On admission of the patient to the hospital, a lumbar puncture was performed, yielding a thin, cloudy fluid containing 95 mg. of protein per 100 cc. and 233 white blood cells, of which 137 were polymorphonuclear cells and 86 were lymphocytes. No abnormalities of the cranial nerves could be elicited except for a horizontal nystagmus. The muscles of the neck and upper extremities showed normal motor power, but there was a complete weakness of both lower extremities. The abdominal skin reflexes were active, but deep tendon reflexes of the legs were completely absent. No Babinski sign could be elicited. There was a complete loss of bladder control, necessitating the insertion of an indwelling catheter. The lower sigmoid showed some inhibition in function. There was no evidence of any sensory changes. A second lumbar puncture on the seventh day yielded clear, colorless fluid containing 47 mg. of protein per 100 cc. with a faint trace of globulin. There were 15 cells per cubic centimeter, with 117 mg. of sugar and 726 mg. of chlorides per 100 cc. A blood cell count showed 17,000 white blood cells with 68% neutrophils. Under conservative management, the fever abated several days later and the patient gradually regained control of bladder and bowel function. No abnormalities in touch, pain, and temperature sensation could be demonstrated at any time. Please give an opinion concerning the differential diagnosis in this case. Has poliomyelitis been reported in people in this age group?*

George M. Knowles, M.D., Hackensack, N. J.

Answer.—Almost all of the acute symptomatology presented in this patient is completely reconcilable with the diagnosis of acute poliomyelitis. Preexisting hypertension does not appear to relate to the history of acute central nervous system infection. The flu-like onset, with the rapid development of lower extremity weakness and the accompanying inability to void is quite characteristic of poliomyelitis. The spinal fluid studies further correlate with this diagnosis. The moderate increase in the spinal fluid protein level may or may not accompany early poliomyelitis. There was apparently complete absence of sensory loss and there was no evidence of encephalitic involvement. The subsequent course was further in accord with the usual progress of poliomyelitis, with rapid improvement in bladder function, improvement in bowel function, and persistence of the motor impairment, which rapidly reached it height. The diagnosis of acute poliomyelitis is well sustained.

In older patients one thinks of cerebrovascular accidents accompanying the hypertension, but the acute course, with spinal fluid pleocytosis and localization of weakness in the lower part of the spinal cord, fairly well excludes this possibility. Infectious neuronitis does not provoke such a cellular response in the spinal fluid and is usually accompanied by sensory loss. Porphyrinemia is accompanied by less fever and by much less cellular response in the spinal fluid. The acute infectious encephalitides localize much less sharply to the lower part of the spinal cord. Postdiphtheritic and other toxic myelopathies provoke much less cellular response in the spinal fluid. Such diseases as mumps, lymphocytic choriomeningitis, and leptospirosis commonly produce much less muscular paralysis. The acute febrile process, with lower extremity weakness and transient bladder paresis, are best accounted for by poliomyelitis. Poliomyelitis in the older person has not been extensively reported but is certainly not unknown. A death from acute poliomyelitis with characteristic histological changes in the spinal cord in a patient of 55 years has been observed by this consultant.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

MUSIC PROGRAM IN NOISY PLANT

To the Editor:—*A functional work-music program was installed in one department of a plant. Within six months, it was so successful that the installation has been extended to other departments, where the noise volume ranged from 90 to 107 db. There has been great relief from fatigue, nervous tension, and boredom resulting from a monotonous type of operation coupled with the extremely irritating noise. As a result, there has been a marked improvement in employee attitudes, with a reduction in absenteeism and turnover. Have others reported a similar result?*

M.D., Wisconsin.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—There is no firm evidence that continued noise causes fatigue, nervous tension, and extreme irritation except during the first few days or weeks of employment. It has been quite successfully shown that exposure to continuous excessive noise, that is, the type found in ordinary noisy industry, is not nerve-wracking or fatiguing after a suitable period of adaptation. Many studies have been made on this problem, and for every study supporting the idea that excessive noise causes a great many psychological disturbances

other studies can be found that deny this. It is not clear exactly what method has been used to reduce the signal noise ratio enough to make the music enjoyable. However, if the music is loud enough to be heard above the noise, which is apparently in the neighborhood of 100-105 db., the possibility that the music itself might produce a hearing loss should be considered.

Further information on this question can be obtained from a monograph by Kryter, "Effects of Noise on Man," *Journal of Speech and Hearing Disorders*, Monograph Supplement I, September, 1950, and a volume prepared by Rosenblith and Stevens called "A Handbook of Acoustic Noise Control: II. Noise and Man," WADC Technical Report 52-204, Wright-Patterson Air Force Base, Ohio, December, 1952.

ANSWER.—Theoretically, it is possible that the introduction of additional sound energy into a noisy area could, under certain circumstances, lower the decibel level beyond that of the highest component. This is a measurable phenomenon, and such measurements should be carried out in the described situation. If, in fact, the decibel level is reduced appreciably, the matter becomes significant. Otherwise, if the decibel peak remains at 107 or conceivably higher, it then becomes appropriate to inquire if the workers would not be better served by measures conducive to reduction of the sound level. While workers exposed to known injurious levels of noise, such as 90 to 107 db., might better adjust themselves to that exposure in the presence of satisfying music, it is not known that the apparatus of the ear would be any less damaged thereby. While it may be gratifying that the installation of music at work has proved acceptable to workers, it still might be salutary to procure a series of audiograms, properly made, in order to be informed as to possible damage produced by the noise.

VITILIGO ASSOCIATED WITH PREGNANCY

TO THE EDITOR:—*A white woman developed vitiligo at puberty; the condition remained stable until she was 25 years of age, when she became pregnant. During her pregnancy the depigmented areas increased in size and number. After delivery the increased involvement was sustained. What explanation can be given for the increased involvement during pregnancy, and what is the recommended treatment?*

G. Bertling Smith, M.D., Columbus, Ga.

This inquiry was referred to two consultants, whose respective replies follow.—ED.

ANSWER.—Inasmuch as the cause of vitiligo is unknown, only an incomplete speculative answer can be offered for this query. It is a fact that hyperpigmentation often precedes the development of vitiligo and that pigmentogenic stimuli of any kind may provoke spread of the disorder. It has been observed that vitiligo sometimes tends to appear and progress under some endocrine constellations that generally stimulate melanogenesis, such as adrenal cortical hypofunction (Addison's disease) and hyperthyroidism. During pregnancy melanogenesis is stimulated by increased production of pituitary melanocyte stimulating hormone as well as by estrogens. These endocrine factors that ordinarily stimulate melanin formation in pregnancy might secondarily also trigger the unknown mechanism by which vitiligo is produced. Because vitiligo is essentially a cosmetic problem, the use of potentially toxic drugs such as the psoralens, especially during pregnancy, is not warranted. Avoidance of exposure to sunlight as well as the use of cosmetic masking agents will serve to make the lesions less conspicuous.

ANSWER.—The cause of vitiligo is unknown; there is no explanation for its vagaries. Pregnancy is more apt to be associated with hyperpigmentation of the skin, rather than depigmentation. It could be that in this patient there is hyperpigmentation of normal skin, which, by its contrast, makes it appear that the vitiligo is increasing. Sometimes, but not always, the administration of Oxsoralen along with ultraviolet rays will benefit vitiligo for as long as the treatment is continued.

"CLEAN" AND "DIRTY" SURGICAL OPERATIONS

TO THE EDITOR:—*Are gastrectomy, colon resection with open anastomosis, and complex hysterectomy where the vagina is opened considered "clean" or "dirty" operations? Would it be proper technique to use the same room immediately after completion of any of these operations for a clean operation such as a varicose vein ligation and resection, and, if not, what should be done to the room to make it usable?*

M.D., New York.

ANSWER.—Gastrectomy is considered a clean operation. Colon resection or resection of any part of the gastrointestinal tract is considered clean. Any instruments contaminated by contents of the gastrointestinal tract are placed in a special basin for contaminated instruments and are not mixed on the instrument table. Contaminated instruments are carried out of the operating room to the work room, where they are cleaned, sterilized, and returned to place with the regular instrument set. Complex hysterectomy where the vagina is opened is considered clean. Contaminated instruments are isolated as mentioned above.

It is proper technique to use the same room immediately after completion of the above type of operations for any type of surgery. Most hospitals try to put their cleanest operations such as for varicose veins at the beginning of the schedule. Dirty cases are considered those in which pus or infectious organisms are encountered, e. g., active gonorrhea, ruptured appendix, osteomyelitis, empyema, tuberculosis, pathogenic fungus, infectious hepatitis, amebiasis, and abscesses. The standard technique for management of dirty cases is based on Walter's text, "Aseptic Treatment of Wounds," New York, the Macmillan Company, 1948. A special cart should be available during contaminated operations. All instruments and linens are placed in receptacles on the cart. Cleaning supplies and special sterilizing solutions should be available on the cart to wash down all furniture, apparatus, floors, and walls where any possible contamination might have occurred, such as around suction outlets and sponge racks. If the

operating room is not air-conditioned, some hospitals allow the room to stand open over night. The department of anesthesiology usually manages their own equipment by washing down their apparatus with sterilizing solutions and soaking airway laryngoscopes, endotracheal tubes, and all contaminated suction tubes in appropriate antiseptic solutions.

RECURRENT PAINFUL APHTHAE

To the Editor:—*A 26-year-old woman, asthmatic since childhood, has been suffering from multiple ulcerations of the tongue and mouth for the past two years. These occur most frequently in the trough between gingival and buccal walls. On the tongue they are small white patches 3 to 4 mm. in diameter and in the gingivobuccal areas a quarter to a half inch in length and half as wide. These latter patches are truly denuded of epithelium and the pain causes interference with nutrition. The appearance of these lesions is cyclic in character, with almost total disappearance during the first few days after the menses. She has been treated with silver nitrate and phenol, repeated smallpox vaccinations, and injections of 10 units of insulin two or three times daily. A hemoglobin level of 60% made me think that iron would cure the condition, but the result is disappointing. Acidulin before meals, a bland diet, troches of tyrothricin and bacitracin, and estrogenic hormones have been equally disappointing. Please suggest other possible causes and treatment.*

Mitchell E. Langner, M.D., West Covina, Calif.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—The etiology of recurrent and painful aphthae is unknown. It is of special interest that, although the herpes virus could not be demonstrated by several groups of investigators, good therapeutic results have been reported following repeated smallpox vaccinations. In some patients with this condition, it has been found that various foods may cause this condition. Elimination diet may, at times, be useful in detecting the causative factor. Injections of snake venom and immunization with herpine vaccine have been of value in some patients, while diluted Fowler's solution as a mouth wash and histamine desensitization have given good results in others with this condition.

Answer.—In a study of the brief summary of this patient, one immediately thinks of a nutritional disease. It would be interesting to know if the patient had received any antimicrobiological drugs prior to the onset of the illness, because Candida and other buccal infections are often seen following administration of these drugs. Since there is such widespread use of various adrenocortical steroids, it is important to consider this information. Such phenomena are not described in ovarian failure, and one would not expect benefit from female sex steroids. A single treatment with silver nitrate and phenol as recorded should not be harmful, but repeated use certainly might cause irritation. Many similar lesions are associated with deficiency states, and it would seem that the chances for cure would lie in that direction. Therapeutic doses of nicotinic acid, riboflavin, and large doses of vitamin A should be tried. Local treatment with diluted hydrogen peroxide and very mild alkaline mouth washes would be the method of choice. The possibility that the patient is consciously or unconsciously doing something to keep the area irritated must be borne in mind.

EFFECT OF THYROID ON PROTEIN-BOUND IODINE

To the Editor:—*Can the thyroid of a 26-year-old clinically euthyroid man, who has been taking doses of 3 grains (0.2 gm.) of Proloid for over 20 years, become depressed by the medication to such a degree that his protein-bound iodine determination now is less than 1 mcg. per 100 ml. of blood or should the reason for this finding be searched for elsewhere? His basal metabolic rate is –7.*

M.D., California.

Answer.—The information given is inadequate for an evaluation of the significance of the laboratory data. The administration of thyroid substances, such as Proloid, inhibits normal thyroid function. It does not, however, result in a lowering of the serum protein-bound iodine. It is known that mercury (e. g., the prior administration of mercury salts) may interfere with the determination of protein-bound iodine. Since this interference is usually only for 24 to 48 hours after the use of the mercurial agent, one would suggest repeating the protein-bound iodine determination. The possibility is also present that this patient who had been taking Proloid for 20 years had omitted the medication some time before the tests were done. Under such circumstances, the inhibition of thyroid production of hormone by the Proloid might explain the normal basal metabolic rate in the presence of a low protein-bound iodine determination. The inhibition of thyroid production of hormone is usually associated with a fall in the basal metabolic rate to myxedemic levels in the course of one to two months after the cessation of thyroid medication, with a slow return to normal as thyroid function resumes. Since this patient has been taking Proloid from the age of 6, the possibility is present of a pathological thyroid state with an inability to recover function.

DENSE SHADOW OF SPLEEN ON X-RAY

To the Editor:—*An x-ray of the lower thoracic and lumbar spine of a middle-aged woman showed the spleen as a very dense shadow of normal contour and size. What is the significance of this finding?*

M.D., New York.

Answer.—It is first necessary to recognize that routine x-ray pictures of the chest and abdomen characteristically show a wide variation in the visibility or density of the "soft" organic shadows, due to technical factors of exposure and due to quantitative differences in intervening fatty and soft tissues from patient to patient. It is important to exclude the previous diagnostic use of Thorotrast. Thorotrast is always more-or-less permanently deposited in both liver and spleen, and for many years afterward these organs are out-

lined by very dense shadows on the x-ray film. The fact that the spleen in this instance was of "normal contour and size" eliminates from suspicion most of the primary as well as secondary diseases that may involve this organ. There is no known specific pathology that would so diffusely delineate a normal-sized spleen. To be doubly certain, a careful complete peripheral blood study and, if necessary, a bone marrow aspiration and cell study should be made, since the spleen is closely related functionally to the blood and blood-forming organs. Should there be any enlarged lymph nodes, biopsy of one could be done, since the spleen also is a lymphatic organ. If results of the foregoing studies are all negative, the x-ray findings must be of no current clinical significance.

EXPOSURE TO RADIATION DURING FLUOROSCOPY

To the Editor:—*A radiologist who complains of fatigue shows no abnormality on physical examination, chest x-ray, electrocardiogram, urinalysis, and blood cell count. He performs fluoroscopic examination of about seven patients each day, five for gastrointestinal series and two for barium enemas, but is not present when his technicians take films, nor does he perform other radiological procedures. Assuming that he uses all precautions, is the amount of exposure to radiation excessive?* *M.D., New Jersey.*

Answer.—With an output of 8 or 9 r per minute during fluoroscopy, the amount of radiation received should be well below the safety point. During usual fluoroscopic examinations of the gastrointestinal tract, the radiologist will receive only a very small amount of radiation, especially if he wears leaded gloves, a leaded apron, and keeps the fluoroscopic field small. The radiologist should subscribe for a badge system and wear the badge during all fluoroscopic examinations. This will measure the amount of radiation he receives. If he is getting less than 0.3 r per week, or 300 mr, this is within the limits of safety. If he is using proper precautions and protection, he is receiving less than 50 mr per week. Therefore, radiation is not excessive and probably not responsible for his complaint of fatigue.

RUBELLA AND PREGNANCY

To the Editor:—*In* The Journal, *Sept. 22, 1956, page 436, is a query concerning rubella in a patient three months pregnant. The consultant advises that "Gamma globulin should be given to the patient, because it will do her no harm and it may be helpful to the fetus." Please cite the evidence supporting this statement.*

Spencer F. Brown, M.D.
68 Ring's End Rd.
Darien, Conn.

The above comment was referred to the consultant who answered the original inquiry, and the consultant made the following comment:

There is no unity of opinion concerning the value of gamma globulin in the prevention of rubella. Krugman and Ward (J. Pediat. **44**:*489, 1954) say gamma globulin is not consistently effective as a prophylactic against rubella. Also, there is some evidence that gamma globulin may modify the disease so that it may occur without rash. The other study of Anderson and McLorinan* (M. J. Australia **1**:*182, 1953) was suggestive of protection. Ward and Parker* (M. J. Australia **1**:*81, 1956) conclude that a dose of 30 ml. of convalescent serum is effective in protecting pregnant women exposed to rubella infections. The patient mentioned in the query had rubella, hence, administration of gamma globulin could be used in her case only for possible preventive effect of damage to the baby. If it is conceded that administration of gamma globulin can have a beneficial effect and causes no bad results, why not give it in the hope that it will prevent injury to the fetus in utero?*

FIBROADENOMA OF THE BREAST

To the Editor:—*A 17-year-old unmarried woman has an enlarged, moderately tender, nodular right breast. This began as a tender swelling just behind the nipple one month prior to examination. At examination the areola was twice the size of the normal left areola and the right breast was one and a half times the size of the left. There was no history of trauma, nipple bleeding, or discharge. Menstrual periods were normal, and no axillary or supraclavicular nodes were palpable. Biopsy showed fibroadenoma with no evidence of malignant cells. She was given testosterone propionate for three weeks. One week after this, no evidence of regression or progression was found. Should this patient have a simple mastectomy? Are male hormones effective in the treatment of this disorder? What is the effect of pregnancy and the menopause on these lesions?*

Robert L. Thomas Jr., M.D., Tuskegee, Ala.

Answer.—This patient should not have a simple mastectomy. Androgen therapy is of no value for this neoplastic disease. A small percentage of fibroadenomas develop into cystosarcoma phyllodes, frank fibrosarcoma, or adenocarcinoma. They should be excised completely and the breast reconstructed. Pregnancy usually but not always stimulates further enlargement of fibroadenomas; the menopause has no effect.

ANAPHYLACTIC REACTION AFTER INJECTION OF VITAMIN K

To the Editor:—*Is there any record of anaphylactic shock after intramuscular injection of vitamin K (Synkamin)? A patient, aged 44, who had no other medication than the above-mentioned injection, went into shock about six minutes after the injection of 1 mg. of vitamin K. No pulse or blood pressure was obtained and there was marked pallor, diaphoresis, complaint of severe pain in arms and legs and in the epigastric region, and difficulty in breathing but no asthmatic sounds in the chest. She made a rapid recovery after administration of Adrenalin chloride solution 1:1,000 and, later, caffeine and sodium benzoate.*

Harry E. Barker, M.D., Ventura, Calif.

Answer.—There is no record of anaphylactic shock after the intramuscular injection of vitamin K or the use of similar preparations. This probably represents a rare reaction, such as may follow the intramuscular injection of many substances.